

## Six Sandia Winners Announced In International R&D Competition

Six I-R 100 Awards for Sandia!

That's the total announced yesterday by *Research & Development* magazine, which sponsors the international competition annually to identify the top 100 technological innovations of the year. The six awards presented to Labs representatives last night in Chicago were the most given to any organization except NASA, which received seven.

Sandia award winners and those who accepted the awards are (no ranked order): a photonic high-speed multi-channel data recorder, Jim Chang (1234); the Particle Beam Fusion Accelerator II (PBFA II), Steve Goldstein (1254); polysilane self-developing photo resists, John Zeigler (1812); SANDAC IV, Charlie Blaine (2336); a carbon-resistance particle analyzer, Bill Wampler (1112); and an X-ray micro-analyzer, Monte Nichols (8313).

"Sandia's six awards cover a wide spectrum of scientific effort, not work in just one field," says research VP Bill Brinkman (1000). "Our winners highlight Labs activities in such areas as solid-state physics, engineering science, and measurement development. I think we can say, with justifiable pride, that the awards confirm that Sandia is one of the premier R&D labs in the country."

Only twice before has the Labs received the prestigious awards. In 1976, T. A. Allen (7484) and Bob Sylvester were recognized for their hot-air solder leveler, which subsequently revolutionized the fabrication of printed wiring boards. Bob Eagan (1840) and Rod Quinn received an I-R 100 in 1984 for development of TA-23 glass; the corrosion-resistant glass has applications in virtually all lithium batteries and promises significant economic impact in other applications as well.

LAB NEWS covered some of this year's I-R 100 winners (specifically, the first four listed above) previously, so capsule descriptions — with references — appear below. More detail is given on the other two developments. Here are the winners:

●*The High Speed Multi-Channel Data Recorder (HSMCDR)* is a new approach to measuring physical observables, using light instead of electronics. It's considered the key system for using photonics in the study of high-speed, single-shot, transient phenomena. Previous state-of-the-art technology was marginal, if not inadequate, in performing measurements that often require recording and transmission of multi-gigahertz (GHz) analog signals up to several-kilometre distances. HSMCDR's cost per channel is 1/10th that of competing electronic technology. HSMCDR is the forerunner of a new technology based on the application of photonic principles to analog measurements, and potentially could become the lead technology for sensing and monitoring physical quantities. As such, it can have a fundamental impact on how we interact with our physical world (see LAB NEWS, May 10, 1985).

●*PBFA II*, the world's most powerful particle beam accelerator, is believed to be the first machine with the potential for igniting a controlled laboratory fusion reaction. Construction was completed last year on the accelerator, which will generate a 100-200 trillion-watt beam of lithium ions and direct them onto a target filled with deuterium and tritium. The PBFA II light-ion approach produces lithium ions at \$25 per joule per pulse compared, for example, to a cost of about \$3000 per joule per pulse for large lasers. PBFA II's principal application is the study of inertial confinement fusion; other applications include production of plasmas for X-ray laser experiments, simulation of particle beam and laser attacks against military targets, and study of implosion hydrodynamics (see LAB NEWS, June 8, 1984; April 12, 1985; Sept. 27, 1985; Dec. 20, 1985). PBFA II co-developers are the Naval Research Laboratory and Cornell University.

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STEVE GOLDSTEIN, supervisor of Pulsed Power Operations Division 1254, was a key member of the team — led by Pace VanDevender (1200) — responsible for the planning of PBFA II, the world's most powerful particle beam accelerator.

## LAB NEWS

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LOW RIDERS OF ESPANOLA could easily be converted into high flyers over the Indian Ocean — or the Bay of Naples — after a stint on the *Nimitz*. Even the heaviest aircraft catapulted off the world's second nuclear-powered carrier (after the *Enterprise*) can reach 170 mph in less than three seconds — at a rate of two planes a minute. The *Nimitz* is scheduled to shift to the Pacific next year, after the *Theodore Roosevelt* is assigned in her place to the Atlantic Fleet. As an aside from LeRoy Sparks (7261), the ice cream that comes on board in 2-1/2 gal. tubs is excellent and vanishes rapidly.

### Joint Ops With the Navy

## Sandians Take Soundings On Board the *Nimitz*

As the tall ships were leaving New York harbor after the Fourth of July fireworks, Executive Vice-President Lee Bray (30) and LeRoy Sparks of Stockpile Evaluation Program Div. 7261 were getting ready for a flight out of Jacksonville, Florida — and a different kind of cruise on the open Atlantic. Their destination: the giant aircraft carrier *U.S.S. Nimitz*, where they would have an opportunity to observe the loading and launching of aircraft with Sandia-developed

weapons aboard.

"Sandians don't often go to launch locations or go on board ship," says Lee. "In most situations, systems evaluation of loadings and launchings is a military responsibility that is handled for the Navy by the Naval Weapon Station people from Seal Beach, California. We go as required, when there are chang-

(Continued on Page Six)

# Antojitos

This Issue and Next First, congratulations to those devices and developers picked as among the top 100 in the country by R & D Magazine yesterday. Quite an honor for you -- and for Sandia.

Next, a plug for our Oct. 10 issue: We're working hard to bring you "a keeper," an issue of the LAB NEWS that's well worth not only reading (of course) but of finding room in your files for. Our goal is to give you a highly readable account of the major contributions Sandia has made over the last 40 years to the nation's nuclear weapon program. The stories will help you explain to your family the importance of those contributions to the nation's defense. The same issue will also include lists of exhibits and a set of maps to help you get from one place to another on Family Day. We currently have Great Expectations for the issue, though we're having a Dickens of a time getting it finished in time for the printer.

\* \* \*

Help, Probability Experts! Last month two of Sandia's token Brits, John Gardner (3153) and Nigel Hey (3163), ended up in the same theatre in London for the same performance of T. S. Eliot's The Cocktail Party. Neither knew the other was in England. And the theatre is so large that each of them could have been there without seeing the other, but both caught a breath of fresh air outside the theatre during the second intermission: "Bit of a surprise, what, old chap?" (Anyone want to calculate the odds on that coincidence?)

\* \* \*

Requests We'd Prefer Not to Have Requested Travel coordinator Chris Roan (3743) reads, with a sharp eye, descriptions of hotel accommodations in cities with DOE facilities nearby. Next time you travel to Mound, you can stay in the Residence Inn in Miamisburg and have some companionship by simply asking for it. At least their new listing says "Rats on Request."

●BH

\* \* \*

The difference between genius and stupidity is that genius has its limits.

## One Weekend's Grace For Family Day Kids' Contest

"Kids' View" halloo!

The LAB NEWS has already seen a few intriguing entries for the Family Day art contest. One example is a girl's sketch of her parent working on cricket boards — with what must be a designer's Muse in the form of feisty little Jiminy Crickets hopping all over on inked feet.

As the LAB NEWS hits the press, we've yet to see some of the other drawings we've heard about. They're just not ending up in the entry box at the

Dome.

Bearing in mind that so many Sandians are scrambling around these last few zany days of September trying to use up — imaginatively and gloriously — any remaining vacation time, we have decided to set back the contest deadline to noon on Monday, Sept. 29. This is it, the final trumpet call. . .

For the ground rules, look up the Aug. 29 issue of the LAB NEWS.

## Fun & Games

Golf — The Third Annual Combined Federal Campaign Benefit golf tournament, sponsored by DOE's Atomic Energy Employees Golf Association (AEEGA), is set for Oct. 25 at the Arroyo del Oso Golf Course. Proceeds will be donated to the Combined Federal Campaign. Registration is open to all interested golfers. Deadline for entering is Oct. 10. The entry fee is \$10 and must be submitted with each entry. For more information, call Eloy Gonzales, 4-3908; Bob Lowther, 4-7839; or Keith Brown, 4-4910.

\* \* \*

Potpourri — SERP classes covering a variety of interesting activities start in October. On the menu are classes in therapeutic massage (\$25), calligraphy (\$25), conversational Spanish (\$10), and country/western dancing (\$35/couple). Call the SERP office, 4-8486, to sign up or to get more info.

### Eight's the Limit

## October 18th Odds & Ends



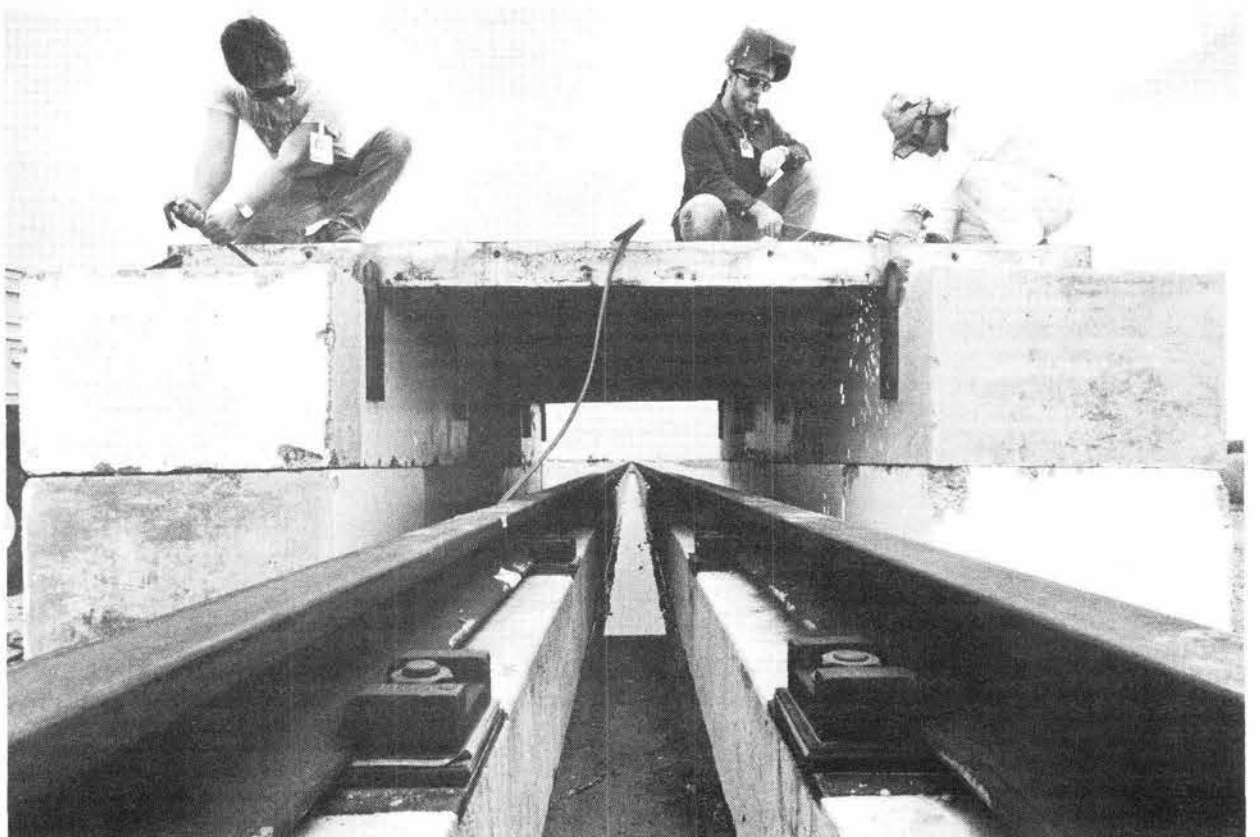
The maximum of family and/or approved non-family guests per employee is eight. Copies of the Guest List (published in the Sept. 11 issue of the Weekly Bulletin) may be used to list more than six guests.

Approval for non-family guests may be obtained from Access Control and Administration Division 3437, located in Bldg. 802, room 135.

Requests for approval of non-citizen guests (other than citizens of Communist-bloc countries, who will not be approved) should be in by today. If approval is received but the non-citizen guest does not attend, Access Control and Administration Division 3437 (at 4-6005) must be informed as soon as possible after Family Day.

Any questions about security matters should be directed to security coordinator Hazlet Edmonds (3431), at 6-4419.

The Oct. 10 issue of the LAB NEWS will contain a complete list of Class-A exhibits, a set of maps of exhibit locations, and a list of hints on safety and security.



GOING THAT EXTRA MILE is no big deal for the rocket-sled people, here (from left) millwrights George Gabaldon, Tim Miller, and Robb Armijo (all 7818), who are busy building a bridge over the track in time for Family Day on Oct. 18. No, visitors won't be allowed to rubberneck on the bridge and be blown away, but the overpass will be handy before the shot for funneling automobile traffic to the other side of the track. The shots (one at 10 a.m. and the other at 2 p.m.) will be Nike rocket motors with a top speed of about 2400 ft. per second. The total time they'll take to travel the entire 10,000-ft. track will be less than three seconds.

## LAB NEWS

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# LEAP: Ready, Set, Go

The 1986 Livermore Employees Assistance Plan (LEAP) committee has established a campaign goal of \$135,000 for this October after Sandia Livermore employees last year gave \$123,000, an amount that topped the original goal by some \$14,000.

This year's chairman, Jim Woodard (8432), hopes to meet the new goal being sought by involving more employees in pledging support and by increasing the size of individual contributions.

"We have identified many very deserving recipients this year," says Jim. "We are increasing to 27 the number of local agencies supported, and are also supporting the United Ways of the Bay Area and San Joaquin County and the California Combined Health Agencies." This is the third year the United Way of San Joaquin County has been added in response to the wishes of the increasing number of employees who live in that county.

Jim noted that the committee's on-site visits to a selected number of the agencies chosen for support reinforced the members' feelings that very worthwhile work is being done, much of it on a volunteer basis, by people who "have their hearts in the right place."

Human service agencies accepted for financial assistance this year include Hope Hospice; Buenas Vidas Youth Ranch; Hope Education Center; Twin Valley Learning Center; Emergency Fund Center; Horizons Youth and Family Services; Kaleidoscope; Livermore Association for Guiding and Teaching Students; The Center for Counseling, Education and Crisis Services; Livermore Play School; and Family Crisis Services. Others are the Tri-Valley Community Fund, Nursery School Scholarship Fund, M2 Prison Sponsors, Agency for Infant Development, American Indian Center, MATCH, Nurses Welfare Fund, and Centro Hispano. Still others are Eden Express, Family Tutorial Program, Nautilus, New Horizons Nursery School, Northern California Society for the Prevention of Blindness, Parental Stress, Valley Counseling Service, and Chapter 5 Recovery Services (first-time funding this year).

In June, the employee committee began interviewing area agencies that had applied for funds and made a final decision last month on the 27 local agencies that would be supported with this year's gifts. Members along with Jim this year are Ken Wilson (8347), Mike Birnbaum (8242), Scott Anderson (8153), Gracie Miranda (8261), Larry Rahn (8354), Betty Carrell (8182), Fred Johnson (8184), Mel West (8023), Cindy English (8201), Stewart Wavell-Smith (8265), and Darlene Loll (8432).

The campaign kickoff date this year is Tuesday, Oct. 14.



SCABBARD'S THE NAME OF THE WAR GAME that was described to four high ranking DoD officials during their recent visit to Sandia Livermore. They were briefed on programs of interest to the Tactical Warfare Office. (They also toured the Combustion Research Facility to look at energetic materials research programs.) Shown being briefed on conflict simulation by Rob Rinne (8470) at left, are (seated from left): Deputy Undersecretary of Defense (Tactical Warfare Programs) Donald Fredericksen, Director of the Office of Munitions George Kopcsak, and Assistant Deputy Undersecretary (Land Warfare) Andrus Viilu; and (standing from left with Rob) Bob Gallagher (8474), Assistant Deputy Associate Director for Advanced Conventional Ordnance at LLNL Jim Humphrey, Jay Mandelbaum from the DoD Office of Assistant Secretary for Acquisition and Logistics, and Rick Wayne (8400).



## SANDIA LIVERMORE NEWS

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LUCKIEST GUY AT SANDIA: Johnny Allen (8262) not only got to be a finalist in the weekly California Lottery on Sept. 13, but walked away with a nice cash prize when the big wheel's pointer landed on the \$100,000 slot. Now Johnny plans to take his wife on a cruise or flight abroad as "the honeymoon we never had when we got married." An 85-year-old San Diego woman hit the grand prize of \$4.2 million. But Johnny is still happy with his winnings, adding that the cash can pay off a lot of bills — even after \$20,000 is taken off the top for taxes.



TRYING ON AN APRON in the Family Crisis Center Thrift Shop at the Rincon Shopping Center is LEAP member Gracie Miranda (8261), watched by committee chairman Jim Woodard (8432).



PLANNING AHEAD was the topic of a seminar offered by Benefits, Medical, and EEO Division 8026 for Sandians nearing retirement age. Subjects covered were health, benefits, Social Security, investments, taxes, AT&T savings, wills, trusts, and estates. Shown speaking on taxes is IRS representative Diane Larder.

## Supervisory Appointment

BILL DROZDICK to supervisor of Project Design Definition Division VII 2858, effective Aug. 16.

Bill has been a member of the Design Definition organization since joining the Labs in July 1961. He led the design definition activities of the W88/JTS program and the implementation activities of Uniform Part Coding within Department 2850.

Bill has an AS in design and drafting technology from Pennsylvania State University and is a Sandia recruiter for technical institute graduates.

He is actively involved in church activities and has managed a Little League baseball team.

Bill and his wife Donna have two children and live in the NE Heights.



BILL DROZDICK (2858)

## feed back

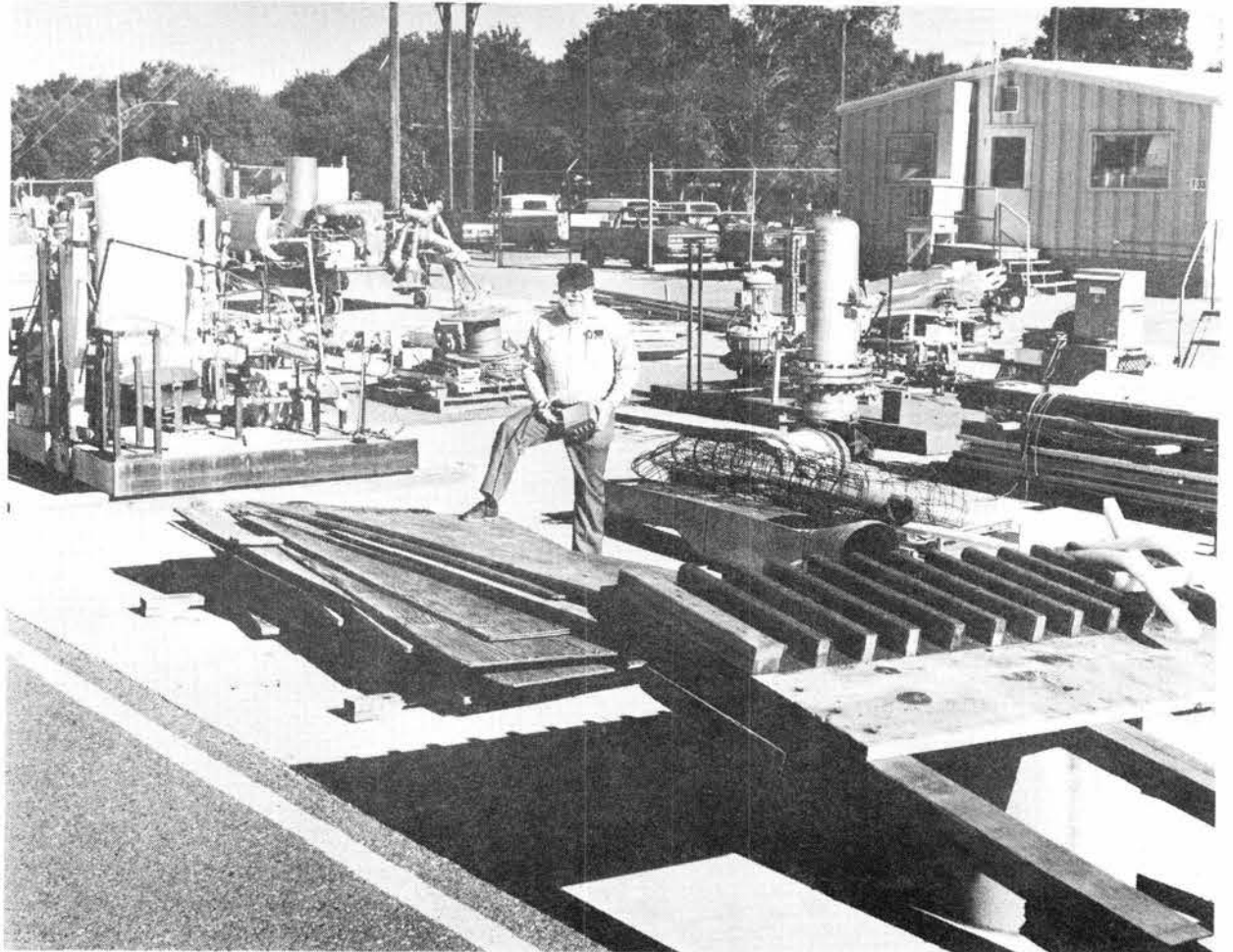
*Q. Why doesn't Sandia offer a self-defense class for employees — both men and women? Such a class could cover basic tips, legal rights if attacked, and physical and psychological defense methods.*

*A. Sandia does not plan to offer any type of self-defense course. That should not be taken, however, as indicating any position against such courses. It simply means we do not feel such training is within our area of expertise. We understand that the Albuquerque Police Department offers a "Self Protection" program to public groups through its Crime Prevention Unit. For information on schedules, call 768-2180. Also, the Coronado Club has offered self-defense courses through its recreation program in the past and is currently surveying the interest level for a future class.*

J. D. Martin - 3400

*Q. With security so important, I don't understand why supervisors do not take a more active role in our monitoring process. It does not seem fair that only staff members be eligible for infractions related to routine security procedures. I think that all employees should be responsible for security. This means that we should all take our turns for securing classified material.*

*A. Locking and monitoring procedures, which are a component of the organization's Security Plan, are generally established by the line organization*



HIS 'DINOSAUR FARM' on its way to targeted extinction via cleanup crews, Jack Cannon (6221) casts a last long look over some souvenirs from the past five years at the thermal and photovoltaic test facility. Sun of a gun, if he didn't find that most gizmos are still usable and probably will be sold. With 28 flatbed truckloads already out, the lot is empty of all throwaways except two heavy pieces.



"BLACKSMITHING IS A VALID art form," says Karl Schuler (1522), left, who has been blacksmithing for about four years. Karl and Paul Lemke (2642), president of the Southwest Artist Blacksmiths Association (SWABA), were at the State Fair demonstrating an older, more difficult, and flashier method of welding than is used today. The 100-year old craft runs in both their families: Karl's father and Paul's father-in-law were blacksmiths. Jumping back from the sparks is 10-year-old Chad, (son of Robb Gunter, 7481), who started when he was 5 years old. Why do these gentlemen have an organization of this kind? "We do it to keep the craft alive," says Robb. Other SWABA members are Sam Griego (7481), Lane Harwell (7481), Len Stans (326), Leif Gonnsen (7475), Don Greene (7481), Larry Clay (CRAY), and Randy Kuehn Topp (NSC).

responsible for securing classified matter. There is no requirement that the actual locking and monitoring duties be taken on by supervisors. They are, however, responsible overall for the security awareness and conduct of the group. As our statistics indicate, they are not exempt from security infractions. During the period 1980 through 1985, Management received 53 security infractions, Staff 58, MAs 10,

Secretaries 10, and Graded 21. Thus, you can see management did not escape the hazards of lack of attention to security procedures they themselves instituted. You are correct in that all employees should be responsible for exercising sound security practices. Most employees are very security-conscious and take their security responsibilities seriously.

J. D. Martin - 3400

# On Being Tough And Loving And Waiting Til It Works

In between the "Once upon a time" and the "They lived happily ever after," there's a story to be told. As happens in real life, it's a continuing story that hasn't yet been resolved. It's also a story that doesn't have a clear beginning.

"I don't know when or where it started," says the Sandian. "But sometime, about when he was 12 years old, my smart, outgoing son started running away from home. We put John in a private junior high school, where he was put back a year. He became a class disruption and spent a lot of time in the principal's office."

Then came high school. For one and a half months, anyway. Then John stopped going to class. He was caught breaking into houses. A month later, he ran away from the principal's office and wasn't found until Christmas. In the meantime, he had committed several burglaries.

The legal system took over at that point. The boy was at a juvenile detention home for awhile. He spent 90 days at a diagnostic center in downtown Albuquerque. He was evaluated by a court-ordered psychologist as being "anxious." There were no other clues. He burglarized again.

The parents were beside themselves. As the Sandian puts it today: "We had no idea what had gone wrong. Our wonderful son, whom we had adopted at three days of age and to whom we had given all the advantages, was out of control."

## Support for Parents

An ad in the paper caught the Sandian's eye. It was for Hogares, Inc., a United Way agency that provided support for parents of troubled teenagers. He and his wife attended a 10-week course on "Tough Love."

What they learned during the course are attitudes and actions that they can still use today. "We learned that, as parents, we had to stop walking on eggshells," he says. "Our son's actions are his responsibility. We can't stop him from doing what he does. But we do have to force him to suffer the consequences of his actions."

John has been very mild-mannered and well-behaved toward his parents, the Sandian admits. That's why the family therapy sessions went so well on the surface, but didn't do so much in terms of getting down to the bottom of things.

It's John's interests outside the home that get him into trouble. "He's told me it's 'exciting' to break into houses," the Sandian says, still perplexed. "He lives for the subculture, and is attracted to other kids that get into trouble."

The court assigned John to a halfway house for juvenile delinquents and drug addicts. As it happened, that particular boarding house was a brand new experiment. "The house wasn't prepared for JDs," the Sandian says. "The kids formed a gang right away. They stayed out all night. They had played the game so long, they knew it better than the counselors did. Several of them ran away."

The Sandian's son was picked up in Denver one and a half years ago. He was sent to a juvenile correction center in Springer (northern N.M.).

Somewhere along the line, a new — and deeper — problem came to light. John was doing drugs. What, exactly, was tough to tell. It became obvious he had hidden it for a long time, and it appeared that he had "tried everything," his father says. John was caught shooting up cocaine when found most recently.

The next step was a drug rehabilitation center in Tennessee. Then a halfway house in Texas and a

Irwin Welber  
President

Sandia National Laboratories  
Albuquerque, New Mexico 87185

Dear Fellow Sandians:

I had the privilege recently of attending a breakfast meeting for the United Way at which Senator Pete Domenici spoke. The meeting was attended by representatives of the Albuquerque business community, and the purpose of the Senator's remarks was to encourage this group to ensure a successful United Way campaign this fall.

The Senator had some very complimentary things to say about Sandia that would have made you all proud had you been there. But he also observed, and I am not sure you are aware of this, that the Department of Energy has taken the position that Sandia is no longer to make cash contributions as it has in the past. This is going to mean that individuals -- you and I -- must dig a little deeper. I am disappointed that Sandia, as a corporate citizen, can no longer contribute. We pressed hard for reconsideration of that decision, but the DOE apparently feels that taxpayers' money, which supports labs such as ours, should not be used for charitable contributions.

As Senator Domenici repeatedly noted, Sandians have contributed generously to the community through the years. Since the start of the Employee Contribution Plan (ECP) in 1957, employees have contributed some \$12 million, most of which has gone to United Way. The Laboratories itself has contributed about \$1 million. Last year (1985) Sandia contributed \$100,000 to United Way. We, the employees, contributed about \$1 million -- 20 percent of the total raised.

That's an extraordinary record by any measure. Even so, I wonder if we couldn't dig just a little deeper this year. When I say a little deeper, I mean up to 10 percent. That's not a trivial request, I know, and some will say that we've already done more than our share. But, as Senator Domenici noted, the Sandia team has met similar challenges in the past. Today, we need a bit of extra effort by everyone.

The theme of the current ECP campaign is "The Need Continues." The work done by local United Way agencies never stops, and as our community grows so does the need for support of these local programs. Let's continue to give them a helping hand by digging a bit deeper if we can.

*Irwin Welber*

few stints in jail, where he went through drug withdrawal several times.

Last January, John ended up in the N.M. State Penitentiary in Gallup with a five-year sentence for breaking and entering to support his drug habit. He's due out on parole in another year, when he's 19.

What can a parent do? "John is not an isolated case," says the Sandian. "My kid's not unique; there are thousands like him in Albuquerque."

The Sandian believes that the Hogares course on "Tough Love" is vital for any parent who's got trouble at home. "You have to learn how and why the kid is manipulating you," he says. "And the course helps you share tactics that work with other parents."

The Sandian has no choice. As a parent, he'll have to try again to be tough and loving to his son — and hope that next time, it'll work. •ID




SHARING A BUNK is only one aspect of learning how to live together in harmony for these two residents of Hogares, Inc. The United Way agency provides both residential and outpatient services for troubled teenagers. Treatment and counseling — particularly for drug and alcohol abuse or mental health problems — involve the parents as well.

## ECP: The Need Continues

The Employee Contribution Plan (ECP) campaign kicks off on Oct. 6 when all Sandians have a week to pledge their support for United Way. The money will be distributed among 43 approved agencies, including Hogares, Inc.

Your contribution is vital to the health of the Albuquerque community. Plan on giving at least your Fair Share: one hour's pay a month, an amount that's equivalent to only six-tenths of 1 percent of your salary.

Thanks to you...  
it works...  
for ALL OF US



**United Way**

## On Board the *Nimitz*

es in aircraft or weapons systems and we need to verify that things are operating satisfactorily. This time we went at my request to observe the early life cycle of two bomb systems.”

Two of the Navy folk from Seal Beach, Keith Le Bouef and David Carlton, were also there on a routine mission of watching the test operations.

### Genesis of JTAs

Quality evaluation of newly developed weapons or those in stockpile — i.e., in DOE or DoD custody — can be handled two ways. One is system laboratory evaluation: The weapon is taken apart — to the extent necessary to remove the “physics package” (the nuclear portion) — and checked at the highest possible level of assembly to see if it’s working properly. The other is flight test evaluation to assess whether the weapon system will function properly during its flight trajectory. The evaluation is performed on weapons “as received,” and sometimes includes weapons that may have sustained minor damage in exercises or may have gotten dented or corroded in storage or transport.

To perform stockpile flight evaluation, random samples are taken from the war reserve stockpile. The weapons are returned to Pantex, the final assembly point in DOE’s Nuclear Weapons Complex, where the physics package is removed and replaced with an instrumented testing package that is the same in mass and dynamic response as the physics package. Strictly speaking, the weapon is then no longer a weapon but a JTA (Joint Test Assembly), which has the mechanical, electrical, and ballistic features of the weapon. The JTA is then returned to the military, where it is reattached to its original weapon delivery system and tested in a realistic sequence to simulate as closely as possible a desired stockpile-to-target sequence.

On this visit, the Navy’s plan was to load two JTA bombs aboard A6 and A7 aircraft that would fly out to the test range at Eglin AFB and drop them at intended targets.

“It was obvious that the loading crew paid careful attention to the smallest details,” recalls Lee. “They made notes and very carefully followed the checklists. All in all, I was quite impressed by the positive attitude and morale on board ship. And the crews’ training seems excellent.”

Another Sandian, Bob Lowery (7261), was already out at the range in LeRoy’s place — along with Maurice Landford and Bruce Ortgiesen from Seal Beach — to observe the drop test and collect data on the target impact and JTA recovery.

### Feedback from Drops

The data from the drop tests came back to the *Nimitz* in several forms. A briefing session was held after one of the pilots returned to the ship and issued his report on release altitude, release speed, and trajectory. Later, “quick look” information — a preliminary check of telemetry data — came in from the range. Finally, a full report will be made after the JTA is recovered from the impact point and an “autopsy” is performed at Pantex on all portions of the system, including any dual-channel (backup) functions.

In this fashion, the JTA serves as a test of DoD and DOE interactions: hardware, software, people, and procedures required to deliver the weapon accurately. “JTAs help demonstrate the compatibility of the military system and the DOE system,” says LeRoy.

•ID

### Work Around the Clock

## Sandians On the Bridge

To get to the *Nimitz* — the star of the movie “The Final Countdown” and, in real life, of the August 1981 confrontation with two Libyan jet fighters — Lee Bray (30) and LeRoy Sparks (7261) boarded a 10-passenger, twin-prop C3 plane used to transport people, mail, and small packages between ship and shore.

“We approached the ship at full throttle,” LeRoy recalls. “Suddenly, there was the deck below. We had a 340-ft. distance [less than the distance between the goalposts on a football field] in which to stop. The four sets of cables in the arrestor gear [used to catch and hold incoming aircraft] are laid out across the deck, spaced 50 ft. apart. Seconds — or was it minutes? — passed and ‘the deck was still moving.’ We weren’t stopping. And then, within a second-and-a-half, we went from 160 mph to a dead stop.”

The passengers had been seated facing aft — backwards — and so the sudden deceleration pressed them — hard — into their seats. The cranial helmets with ear pads, noticeably uncomfortable during the flight, became very useful as they stepped out onto the flight deck, a very noisy area during what was a regular working day.

Well, it was regular as far as flight operations went — aircraft were coming in and out every few seconds, as usual. However, the presence of 42 Naval inspectors on board may have had something to do with the first message the two Sandians heard over the loudspeakers: “General quarters are in effect.” That was an operation shutting down all movement of nonessential personnel on board, meaning confinement to quarters and locked hatches between decks. (Other simulated emergencies during the visit included the showers being shut down and the lights going off.)

The addition of several dozen people to the 6000 or so normally on board resulted in tight quarters. After four hours passed, general quarters was over and bunks were finally found for the Sandians. LeRoy was assigned to officers’ quarters: about 60 people in triple bunks. Lee stayed with the ranking officers at what is called the Hilton: deck bunks for four and a lavatory in the room.

The 24-hour operating mode caught them up immediately. Officers were coming and going at

all hours. Foam ear plugs were absolutely necessary, though sometimes insufficient, for a night’s rest. There were intermittent, deafening vibrations because the arrestor cables — terminating in 3-ft.-diameter shock absorbers — that came down through the ceiling (from the hangar and flight decks) tautened with every landing, and zinged back upon release.

The first meeting, a post-board briefing, was held that night at 11:30. But it wasn’t until the next morning, after a pre-flight meeting, that the test was ready to roll (see “Sandians Take Soundings”). Weapon loading operations for both aircraft were performed on the flight deck while normal aircraft arresting and catapulting operations continued. Then Lee and LeRoy went to the crow’s nest to observe the aircraft launchings.

As they waited for the pilots to return from Eglin AFB, they had a chance to talk to their guide, Lt. Ron Rose, and hear what it’s like to be on duty below deck and not see the sky for two or more weeks. (The flight deck is open — for people not on duty — for exercise and jogging in the wee hours.) They also had a chance to meet the ship’s photographer, Craig Anderson, whose dad Don (7172) works at Tonopah Test Range.

There was time to look around the largest and most powerful warship ever built. The area of the flight deck alone, 4.5 acres, is larger than the floor space in all Area IV buildings put together. The *Nimitz* is powered by two nuclear reactors that can operate for more than 13 years — up to a million miles of travel — between refuelings.

The carrier is protected by three layers of defense: the Air Wing (nine squadrons flying seven different types of aircraft), several escort ships, and her own defensive batteries — NATO Sea Sparrow missile system, Close-in Weapons System, and electronic countermeasures.

As many as 90 aircraft can be found on board at any given time.

The two Sandians weren’t catapulted off the aircraft carrier for their return flight. The 1092-ft. length of deck was sufficient for takeoff in their twin-prop aircraft, which started at the far end of the deck while the 91,000-ton *Nimitz* churned into the wind to help along the plane’s lift.



SOUVENIRS OF TWO WORKING DAYS on the *Nimitz* for Lee Bray (30), on right, and LeRoy Sparks (7261) are two caps: CVN-68 stands for Carrier Vessel, Nuclear-powered; the ship is 68th in the series of U.S. aircraft carriers. While on board, the two Sandians heard the special weapons loading team call off procedures from checklists, which are briefs of the Navy’s Tech Orders, which in turn are based on — and sometimes taken verbatim from — Sandia’s source data.



## 'Care and Feeding' Of Weapons

Where does Sandia fit in? Usually, it's early on in the weapons development and testing sequences. However, Military Liaison Dept. 7210 also has several functions in preparing, checking, and updating procedures as required throughout the life cycle of a weapon.

Don Rohr, supervisor of Weapon Procedures and Logistic Support Division 7212, says that "Sandia generates basic data for procedures the military needs for maintaining the stockpile of weapons. These include handling, transport, periodic maintenance, fuze setting, loading, fire-fighting, spares support, and explosive ordnance disposal (EOD).

"The actual step-by-step procedures prepared by 7212 are the results of a team effort by 7200, 8100, and 5100," Don continues, "and are checked out with DOE, Field Command Defense Nuclear Agency, and the military services."

In the case of aircraft loading, the military combines the Sandia-prepared source data on weapons with specific aircraft procedures. The Naval Weapons Evaluation Facility and the Air Force Weapons Laboratory — both at Kirtland AFB — prepare the loading and delivery handbooks for the Navy and Air Force respectively.

There are 12 people in Don's division, representing more than 300 years of experience with the various aspects of nuclear weapons. Their varied backgrounds reflect a composite experience of mechanical and electrical engineering, military careers in nuclear weapons, long-standing expertise in procedural development, and an in-depth knowledge of the spares required for

stockpile support.

The majority of 7212 staff members are procedures specialists who — along with 5100, 8100, and 7200 — engineer the development of the source data into weapon publications. The other four staffers are spares analysts who coordinate the provisioning requirements with the systems design organizations to support the weapons during their stockpile life. Their knowledge of spares encompasses a varied line of items, ranging from nuts and bolts to major components.

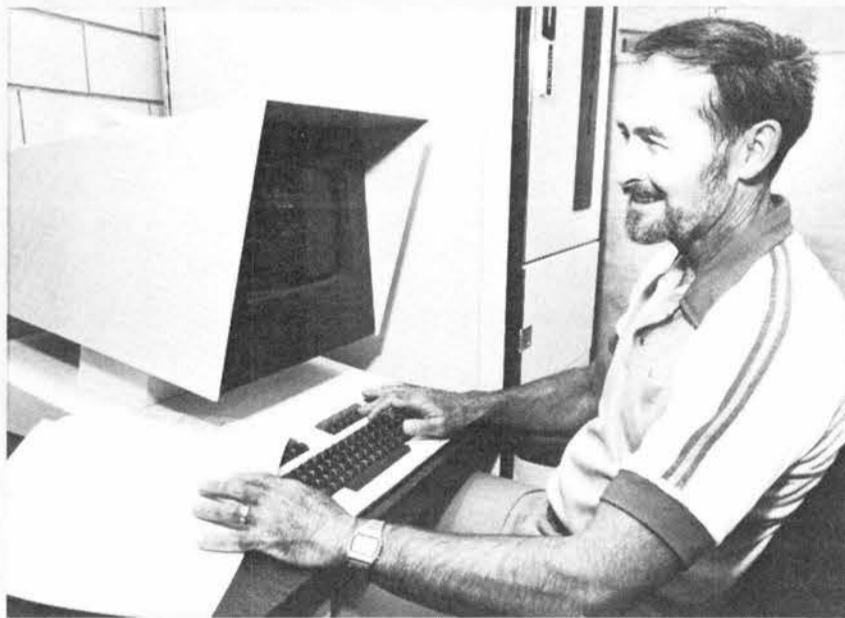
### Hands-On Training

Other aspects, such as training and field assistance, are handled by the fourteen engineers in Weapon Training and Evaluation Division 7213, supervised by Judy Mead.

"We train military instructors, pilots, and EOD and maintenance personnel, using hands-on training whenever appropriate," says Judy. Her division also has a joint task group with the military for making sure field procedures are correct — and doable. Technical field assistance is provided when requested by the military on design organizations.

"Another important function is liaison with the military at the field locations we serve," Judy explains. "In this capacity, I spent a day on the *Nimitz* — also escorted by Lt. Ron Rose — last fall, while she was in port at Palma de Majorca. We have a training responsibility for the onboard EOD and maintenance detachments. And observing them in action was certainly one of the highlights of my trip."

HELPING THE MILITARY KEEP TABS on the stockpile is Bob Armstrong (7212), who is developing procedures for a headquarters code processor (pictured here) used in the command and control aspects of nuclear weapons management. Bob is one of eight procedures specialists who develop "Joint Nuclear Weapon Publications System" manuals to support the nuclear weapon stockpile and its ancillary test gear.



SEASONED SPARES ANALYSTS Howard Stuart (left) and Art Finlayson (both 7212) review flow diagrams of a weapon system in stockpile. Using engineering drawings and designs, DOE documents, and Sandia development reports, their task is to manage the provisioning conference during which they develop an inventory of parts that will need to be replaced periodically.

## Events Calendar

- Sept. 26-27 — Concert, NM Symphony Orchestra and Chorus, 8:15 p.m., Popejoy Hall, 842-8565.
- Sept. 26-30 — Exhibit, Ye'ii, Ye'ii Bichai and Navajo dry painting ceremonial tapestries; 9 a.m.-4 p.m. Mon.-Fri., 10 a.m.-4 p.m. Sat.; Maxwell Museum of Anthropology, 277-4404.
- Sept. 28 — Movietime at the KiMo, Great Cities and War and Peace Series, 7 p.m., KiMo, 848-1374.
- Sept. 28-Oct. 4 — "Tales of Hoffman," Albuquerque Opera Theatre/Opera Southwest production about the disillusionments of love; 8 p.m. (2 p.m. Sun.); KiMo Theatre, 243-0591 or 243-8492.
- Sept. 29-30 — Feast Days of San Geronimo; sundown dance on the 29th, daybreak ceremonial foot races, pole climb, arts & crafts fair; Taos Pueblo, 758-8626.
- Sept. 30 — Keller Hall Series: piano concert, Evelyn Brancart (UNM faculty); Keller Hall, 277-4402.
- Oct. 3 — Joe Henderson/Bobby Hutcherson/George Cables Allstar Quintet from San Francisco, sponsored by NM Jazz Workshop; 8 p.m., KiMo, 243-3208.
- Oct. 3-5 — Art Show, "Hanging Together," Fine Arts Gallery, NM State Fairgrounds, 265-1791.
- Oct. 3-4 & 10-12 — "On the Town," the Broadway and Hollywood hit musical; 8 p.m. (2:30 p.m. Oct. 12), Albuquerque Little Theatre, 242-4750.
- Oct. 3-5 — Grecian Festival: Greek food, dancing, Palamakia Folk Dancers; 11 a.m.-11 p.m., free; Saint George Greek Orthodox Church (308 High St. SE), 247-9411 or 242-2212.
- Oct. 3-5 — New Mexico Gun Show, antique and modern firearms; 8 a.m.-6 p.m., Agriculture Bldg., NM State Fairgrounds, 298-1108.
- Oct. 3-26 — "La Dama Duende," comedy by Calderón, La Compania de Teatro de Albuquerque; 8 p.m. Fri. & Sat., 3 p.m. Sun.; Nuestro Teatro (3211 Central NE), 256-7164.
- Oct. 4-12 — 15th Annual Albuquerque International Balloon Fiesta (new field between Pasco del Norte and Alameda Blvd.), 344-3501.
- Oct. 5 — Pinto Horse Show, Outdoor Arena, NM State Fairgrounds, 265-1791.
- Oct. 5 — Benefit for Maxie Anderson-Ben Abruzzo International Balloon Museum: Cowboy Brunch, food and entertainment, celebrities; 9:30-1 p.m., Anderson Valley Vineyard (4920 Rio Grande NW), 247-8900.
- Oct. 5 — Concert, Andre Watts, NM Symphony Orchestra; 3 p.m., Popejoy Hall, 842-8565.
- Oct. 7 — UNM Hospital Auction, Youth Hall, NM State Fairgrounds, 265-1791.
- Oct. 10 — "Apple Festival," luncheon and bazaar, benefit for All Faiths Receiving Home; 10 a.m.-2 p.m., First United Presbyterian Church (215 Locust NE), 345-8938.

## Welcome

Albuquerque

Terri Giron-Gordon (3533)

New York

Edward Boucheron (7263)

## Congratulations

To Trudy and Charles (324) Randour, a daughter, Maleri Renè, Aug. 14.

To Janette and Bruce (324) Walker, a daughter, Andrea Mae, Aug. 18.

To Joyce and John (324) Wolfe, a daughter, Jennifer Lynne, Aug. 26.

## Sympathy

To Helen Pope (7861) on the death of her mother in Albuquerque, Aug. 18.

To Everett Ard (7252) on the death of his mother-in-law in Albuquerque, Aug. 18.

## I-R 100 Awards

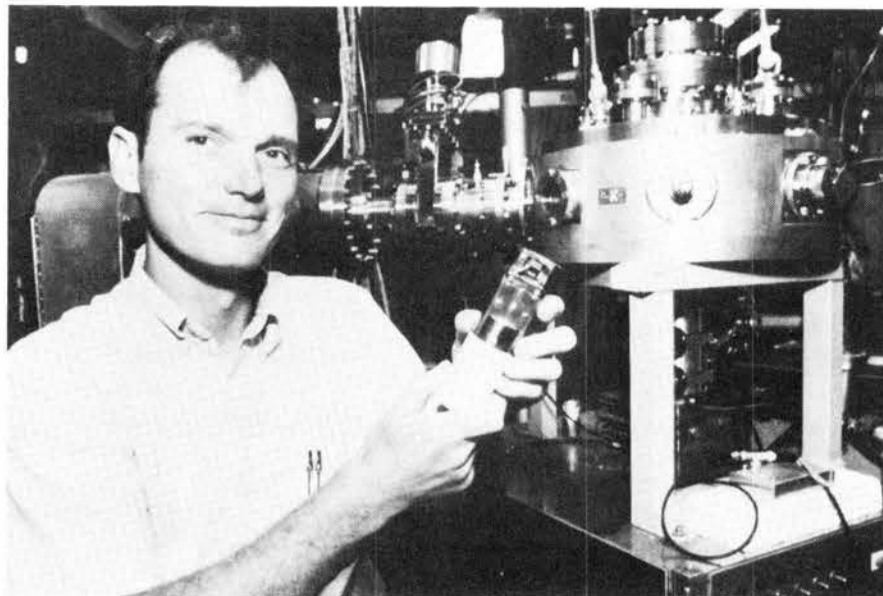
●*Polysilane self-developing photoresists* are a new class of silicon-based polymers that have considerable promise in photoimaging applications, particularly high-resolution ones such as very large scale integrated (VLSI) circuit microlithography. The photoresists greatly simplify high resolution imaging by reducing the number of process steps by 30-50 percent, translating to a large savings in processing costs. Self-developing polysilanes have many applications, including microlithography in integrated circuit manufacture, printed circuit board manufacture, decorative photopatterning, and manufacture of precision parts by photofabrication. This development should have a significant impact on the microelectronics industry, which requires more efficient manufacturing methods to continue the trend toward less expensive chips (see LAB NEWS, Nov. 9, 1984).

●*SANDAC IV (Sandia Airborne Computer)* is a parallel processor embedded computer that puts the computational power of a large desk-sized general-purpose computer into a 20-lb. package the size of a shoe box. It processes data at extraordinary speeds, making it a natural for embedding in, for example, sophisticated helicopters to help pilots control complex guidance and weapons functions — even in the less-than-a-split-second reaction times required in combat situations. Parallel processing (many microprocessor chips working simultaneously) gives SANDAC the power of many individual computers condensed into a single unit. The computer is the only embedded parallel processor currently available; as a result, it has the lowest power consumption and smallest size for equivalent performance of any embedded computer. More than half a dozen companies have requested permission to manufacture the unit (see LAB NEWS, Aug. 16, 1985).

●*The carbon-resistance particle analyzer* invented by Bill Wampler (1112) measures, in real time, quantities and energies of atomic particles bombarding it. Though it's likely to have other applications as well, Bill designed it specifically for use in fusion reactors to measure the energies of particles escaping from magnetically confined plasmas in the reactors.

"Plasmas inside fusion reactors are confined by strong magnetic fields," says Bill. "But because this confinement is not perfect, some of the plasma particles escape and hit the wall. One of the big problems in fusion energy is the interaction of these particles with the wall; stray particles may stay in the wall, which can decrease its mechanical strength. Also, plasma density is reduced."

Another problem, Bill explains, is that stray plasma particles also knock metal atoms out of the reactor's wall into the plasma, causing erosion of the wall and degradation of the plasma. Therefore, it's important to know — at the moment it's hap-



BILL WAMPLER (1112) holds his carbon-resistance particle analyzer, designed for use in fusion reactors to measure the energies of particles escaping from magnetically confined plasmas in the reactors.

pening — how many particles are reaching the wall and what energies they have.

The particle analyzer consists of a thin carbon film evaporated onto a quartz substrate with metal pads for electrical contact. A constant current is supplied through two outer contacts and the voltage drop during particle bombardment is measured across two inner pairs of contacts.

Energetic particle bombardment increases the electrical resistivity of carbon caused by damage to its structure, Bill learned in earlier research. Carbon shows a much larger change in resistivity under energetic particle bombardment than do metals, and is a key to the analyzer's sensitivity at very low energies.

"So far, the analyzer's shown excellent results," says Bill. "We've run simulation demonstrations in ion accelerators and have tested it in four major tokamaks and a magnetic-mirror fusion device."

The analyzer's capabilities currently are unique, Bill explains. Conventional surface-barrier detectors do not work at sufficiently low energies. And passive collection probes do not provide on-line data during fusion reactor operation; only later analysis can show how many particles have been absorbed.

Besides its ability to sense very low energies, other advantages of the new device are its small size, ruggedness, and ability to operate at the high temperatures produced inside reactors. In addition to its current application in fusion reactors, it's expected to prove valuable in other technologies involving low-energy ion bombardment, such as plasma processing of materials.

●*The X-ray microanalyzer*, co-developed by Monte Nichols and Dale Boehme (both 8313) of SNLL and Richard Ryon of LLNL, is the first instrument that can measure X-ray microfluorescence, X-ray microabsorption, and electron density — all at one time and on the same sampling area of a material. The original sample's X-ray microdiffraction properties can also be measured at a later time.

The microanalyzer is also the first device to allow the display of the data as a "topographic" map: The four properties are plotted against position on

the sample. The resolution is very fine: down to several microns (millionths of a metre). "The ability to map or image a sample in terms of these parameters," says Monte, "provides a valuable diagnostic tool in materials development, fabrication, and manufacturing."

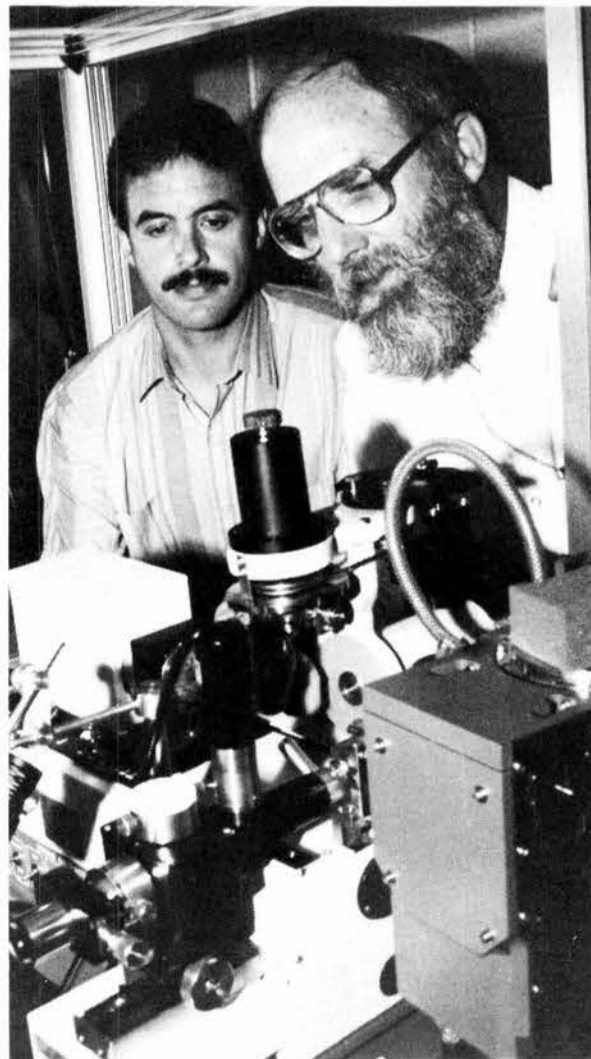
The principal application of this instrument is to map changes in solid materials: to identify concentrations of chemical elements, to examine sample homogeneity, and to determine densities by looking at mass thickness. Other applications include determining whether different materials are compatible or identifying very low concentrations of impurities. Still other uses can be foreseen in biological systems, integrated circuit design, and metallurgy.

According to Monte, there are three primary advantages of the X-ray microanalyzer over existing instruments.

"Existing X-ray fluorescence equipment cannot match the 15-micron-diameter beam size [about 1/7 the diameter of a human hair] of the X-rays generated by the source connected to the device," says Monte. "The low detection limits available with this instrument are also unmatched." (The unit has a detection limit of 40 picograms of gold — 1 pico-

(Continued on Next Page)

JIM CHANG'S (1234) High-Speed Multi-Channel Data Recorder (HSMCDR) potentially could become the lead technology for sensing and monitoring physical quantities. It uses light instead of electronics in the study of high-speed, single-shot, transient phenomena.



A TYPE OF X-RAY VISION becomes possible with the X-ray microanalyzer developed by Monte Nichols (right) and Dale Boehme (both in Exploratory Chemistry Div. 8313). The instrument—coupled with an X-ray generator—allows them to see structures beneath the surface of semiconductor devices.



## Six Winners

gram is one-trillionth of a gram, and is related to 1 gram in the same way that one drop of water would be related to all the water in an Olympic-sized swimming pool — when using a 100-micron collimator, a silver-anode target powered at 12 kW, and 400 seconds of counting time.)

Then, the X-ray beam generated by the instrument can penetrate a sample without destroying it, he explains. This feature allows the imaging of layers or structures well below the sample surface.

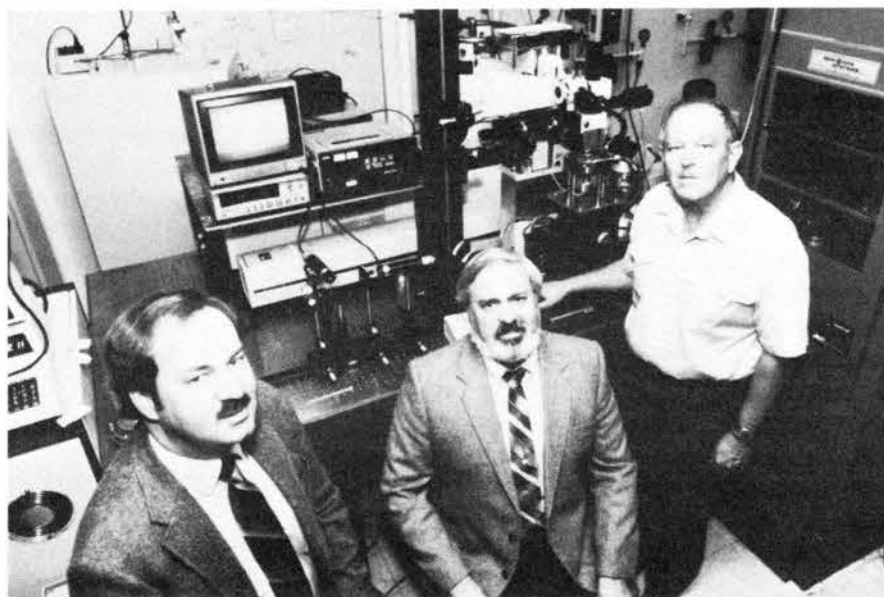
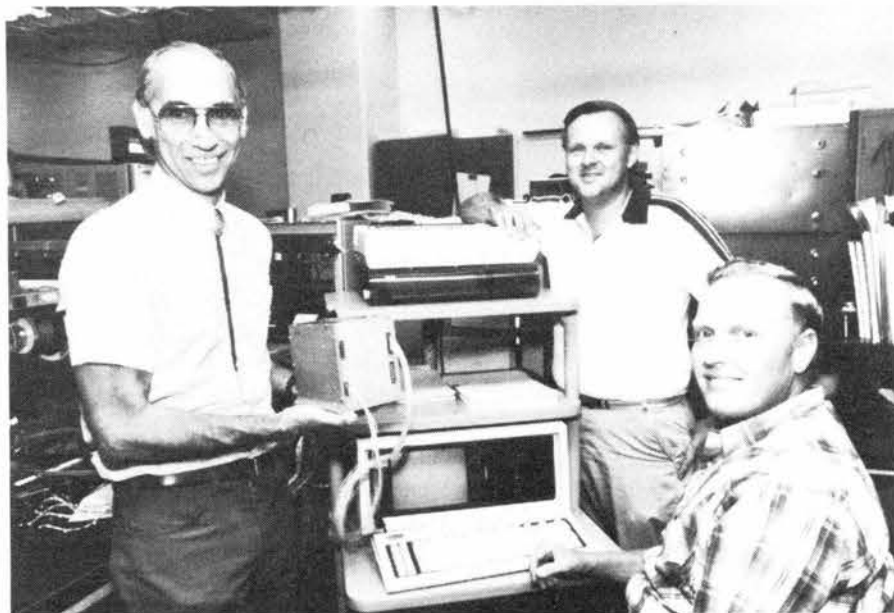
Finally, "biological and other non-conductive materials can be tested for the presence of elements without altering the sample," he says. (Use of electron optical techniques requires either coating the sample with a conductive film or examining the sample in a vacuum.)

The X-ray microanalyzer, located at SNLL, uses an 18-kW rotating anode X-ray source employing one of several anode materials. X-ray fluorescence data are collected using an energy-dispersive detector located close to the sample. The electron density is determined using the Compton scattering peak in the energy-dispersive spectra.

X-ray absorption measurements are made using a scintillation detector in the direct beam behind the sample. A beam splitter is used in combination with another scintillation beam detector to monitor — and correct for — any intensity fluctuations in the incident beam.

X-ray powder diffraction data are collected using a scintillation or proportional detector equipped with an annular slit.

CHARLIE BLAINE (2336, left), leader of the SANDAC IV development team, demonstrates the device that puts the power of a large general-purpose computer into a package the size of a shoe box. Paul Pierce, right foreground, and Charles Borgman (both 2336) were key contributors to the SANDAC project.



CO-DEVELOPERS (from left) John Zeigler (1812), Wayne Johnson (1126), and Larry Harrah (310) developed polysilane self-developing photoresists that have considerable promise in high-resolution photoimaging applications such as VLSI circuit microlithography.

## Take Note

Gordon Smith (3314) was the chairman of a national committee that met during the Haztech International Conference and Exhibition in Denver Aug. 11-15. The purpose of the committee was to form a Hazardous Waste Federation that will help hazardous waste professionals improve communication between regional hazardous waste organizations and to emphasize the need for highly qualified professionals in the field.

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The National Contract Management Association (NCMA) has designated Jon Bedingfield (3731) as a Certified Professional Contracts Manager. To be certified, the candidate must pass the six-hour CPCM examination offered twice yearly by the 19,000-member NCMA. The NCMA certification program recognizes individuals who have accomplished a high level of education, experience, and training in the procurement and contracting profession.

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The Albuquerque Chapter of the National Contract Management Association is sponsoring a Fall Regional Educational Conference Oct. 9-10 in Albuquerque. Title of the NCMA conference is "Procurement Frontiers: Rise to the Challenge." For more information, contact Roger Shinnick on 4-3720.

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The New Mexico Chapter of Physicians for Social Responsibility and the New Mexico Medical Society are sponsoring a health and peace symposium at UNM on Sept. 28. Participants include American and Soviet physicians involved in the aftermath of the Chernobyl atomic reactor accident last spring. Dr. Leonid Ilyin, a specialist in radiation biology who's been closely involved with Chernobyl patients, heads the Soviet delegation. The symposium starts at 4 p.m. at the UNM Continuing Education Conference Center (1634 University NE) and is open to the public. Tickets may be purchased at the door for \$15; students with I.D., \$10.

"Acute Respiratory Failure" is the theme of the second annual Balloon Fiesta Lung Disease Conference for nurses, respiratory therapists, and physicians. It's scheduled for Oct. 10-11 at the Veterans Administration Hospital in Albuquerque. The conference is sponsored by the New Mexico Thoracic Society and the American Lung Association of New Mexico. For more information, contact the Lung Association on 265-0732.

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"Access to Space: Post-Challenger" is the second in a technical symposium series sponsored by Booz, Allen & Hamilton, Inc. The lecture/discussion is scheduled for Oct. 2 at 12 noon at the UNM Continuing Education Center. Former astronaut William Lenoir will be the speaker. The symposium series, "New Directions in Defense Science and Technology," is open, free of charge, to technical professionals in the Albuquerque area. Reservations are required. If you would like to attend the Oct. 2 symposium, call Booz, Allen & Hamilton, Inc., at 247-8722.

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Have fun dancing your way to fitness with the Scandia Dancers Folk Dance Group. You can join them on Wednesday nights from 7-8:30 p.m. at St. Timothy's Lutheran Church (211 Jefferson NE). For more information, call Neal (2336) or Lois Nelson on 265-7482.

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The Society of Logistics Engineers (SOLE) will hold its monthly general membership meeting at the West Officers Club on Sept. 30 at 11:30 a.m. Guest speaker is Curt Harris, project manager for a LATA investigation (sponsored by Sandia and the Strategic Defense Initiative Office) of phenomena associated with high-altitude nuclear detonations. He will discuss applications related to ballistic missile defenses and some of the computerized methodology used in LATA investigations. Lunch will be pay-as-you-

go in the cafeteria line. For reservations, contact Maj. Jack Shacklett on 6-5649.

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Ronald McDonald House opened in 1982 and since that time more than 3000 moms, dads, kids, grandparents, aunts, and uncles have stayed there while their young patient was undergoing medical treatment at an Albuquerque hospital. The Ronald McDonald House (1011 Yale NE) will be holding an Open House on Oct. 1. Stop by for just a moment or take a complete tour of "the house made of love." Learn about New Mexico's "home away from home" for families and seriously ill children and find out about how you can become a special volunteer; daytime, evening, weekend, and at-home jobs are available. For more information, call 842-8960.

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Harold Myers (7241) and Gene Daniels (retired) are looking for anyone who graduated from Joplin, Mo., High School during the mid- to late-1940s. A reunion picnic is planned for Oct. 11 at the Elena Gallegos picnic area, starting at noon. Graduates can contact Harold on 4-7539, or Gene on 299-0136.

### Middle-Age Spread Gets Go-Ahead



... "A new controversy over the safety of moderate weight gains in middle age has been set off by a Federal researcher's challenge of the prevailing medical view that lifelong efforts to stay lean are best for health. The lowest death rates are associated with 'leanness in the 20's followed by a moderate weight gain into middle age,' contends the researcher, Reubin Andres [Nat. Inst. on Aging], who has garnered the support of some leading gerontologists. 'For some reason the idea has grabbed us that the best weight throughout the life span is that of a 20-year-old ... but there's just overwhelming evidence now that as you go through life it's in your best interests to lay down some fat.' A majority of experts on obesity and on cardiovascular diseases disagree. Theodore B. Van Itallie [Columbia U., N.Y.] said his own recent studies indicate that being overweight is most harmful before the age of 45. But he said it is still a threat in later years and he does not advocate the weight gains."

Erik Eckholm, *New York Times*

# Test Your 'Healthy Heart' I.Q.

The National Heart, Lung, and Blood Institute is conducting a campaign to make Americans more aware of what they can do to prevent heart disease. Sandia Medical suggests that you take this Institute-developed quiz so you can learn what you know about reducing the risk of heart disease. Answer true or false to each question:

1. The three most important heart disease risk factors that you can do something about are high blood pressure, smoking, and elevated blood cholesterol.
2. A heart attack or stroke is often the first symptom of high blood pressure and/or elevated blood cholesterol.
3. People with high blood pressure are generally nervous and tense people.
4. A blood pressure level of 140/90 or more is generally considered to be high.
5. High blood pressure is even more of a problem among blacks than it is among whites.
6. It is just a scientific theory that elevated blood cholesterol is related to heart disease.
7. Dietary cholesterol is found only in animal foods.
8. The most effective dietary way to lower the level of your blood cholesterol is by eating less cholesterol.
9. A food product in your grocery store that is labeled "no cholesterol" is a safe choice for people with elevated cholesterol levels.
10. Cigarette smoking by itself will increase your risk of heart attack.
11. In addition to the large number of cancer and heart disease deaths that result from smoking, more than 90 percent of all emphysema deaths are due to smoking.
12. People who quit smoking reduce their chances of developing heart disease.
13. Heart disease is the No. 2 killer of women in the United States.
14. Physical inactivity is related to heart disease.

## Answers

1. TRUE. Though there are other risk factors that you cannot change, such as family history and age, the three major risk factors that you can change are high blood pressure, smoking, and elevated blood cholesterol. Someone who has all three of these risk factors is about eight times as likely to develop heart disease as someone who has none of them.
2. TRUE. A person with high blood pressure or elevated blood cholesterol may feel fine and look great; there are often no signs at all that might signal these conditions until a heart attack or stroke occurs. To find out if you have elevated blood cholesterol or high blood pressure, you should be tested by a doctor, nurse, or other qualified health professional. The blood cholesterol test currently requires a laboratory analysis of a sample of your blood.
3. FALSE. High blood pressure does not mean that a person is nervous or tense. It means that the blood flowing through your body is pressing against your artery walls too strongly. Calm and relaxed people can have high blood pressure.
4. TRUE. The higher your blood pressure is, the higher your risk of developing heart disease or having a stroke. To reduce high blood pressure—that is 140/90 or higher (either number)—it must be treated and controlled. If you have high blood pressure, follow your doctor's advice: get and keep your weight down to normal; decrease your consumption of sodium—not only table salt, but also foods with a high sodium content such as some snacks and processed foods; and remember to take your medicine if it is prescribed.
5. TRUE. While high blood pressure affects more than 28 out of every 100 white adults, it affects

more than 38 out of every 100 black adults. Also, high blood pressure is generally more severe among blacks than whites.

6. FALSE. Scientific studies have shown that people with high blood cholesterol are more likely to develop heart disease than people with lower levels of blood cholesterol. People with a blood cholesterol level over 265 mg/dl (milligrams per deciliter of blood) may have four times the risk of developing heart disease as those with a level of 190 mg/dl or lower. It has also been shown that people who have elevated blood cholesterol and reduce it also reduce their risk of having a heart attack.

7. TRUE. Dietary cholesterol is never found in foods from plants. All meat, poultry, fish, and butter fat contain cholesterol; the richest sources are liver, brain, kidney, and egg yolks.

8. FALSE. Reducing the amount of cholesterol in your diet is clearly important; however, eating less saturated fat would probably be the more effective dietary means of lowering your blood cholesterol levels, along with eating less cholesterol and substituting polyunsaturated fat whenever possible for saturated fat. Saturated fat (found in meats, dairy products such as whole milk, cream, ice cream, cheese, and butter, and certain cooking fat such as shortening) contributes greatly to the raising of blood cholesterol. To reduce your consumption of saturated fat, you should choose lean meats, poultry, or fish; trim excess fat from meats before cooking; broil, bake, or boil rather than fry; and use skim or low-fat dairy products.

9. FALSE. A product can contain no cholesterol and still be high in saturated fat—which will raise your blood cholesterol. Examples are commercial baked foods made with coconut oil, palm oil, or a heavily hydrogenated vegetable oil. As you shop, be sure to check the labels on food products. You will often find a listing of the amounts of saturated and polyunsaturated fat contained in the product. Your best choice is a product that contains more polyunsaturated fat than saturated fat; polyunsaturated fat will lower your blood cholesterol. Vegetable oils that are high in polyunsaturated fat include safflower, sunflower, corn, and soybean oil.

Remember, though, that all fats are a rich source of calories, and for people who are overweight, it is desirable to consume fewer calories and less fat of all kinds.

10. TRUE. Smoking is a definite and strong risk factor for heart disease. The heart disease death rate among smokers is 70 percent greater than that of nonsmokers. Heavy smokers are, of course, at even greater risk, and those smokers with elevated blood cholesterol or high blood pressure increase their chances of heart disease dramatically.

11. TRUE. Emphysema, a lung disease that makes breathing difficult and often leads to death, would be almost eliminated if people did not smoke.

12. TRUE. Absolutely. Smokers can and do reduce their risk of coronary heart disease and early death when they quit smoking. In one major study, cigarette smokers who quit smoking had a risk of heart disease death that was about one-half (54 percent) that of those who did not quit.

13. FALSE. It is the No. 1 killer. Of the 750,000 Americans who die each year of heart disease, 350,000 of them are women. In addition, almost 100,000 women die each year of stroke.

14. TRUE. People who are inactive tend to have more heart disease than people who are physically active. Regular brisk and sustained exercise improves overall conditioning. It can often help reduce blood pressure levels and also help people lose excess weight and lower their blood cholesterol. In addition, there are reports that suggest that smokers who exercise are more likely to give up smoking. Finally, regular aerobic exercise can improve the way that you look and feel.

## Community Focus Series

### Aerobics, Not Heroics



During the Renaissance, professional runners were considered definitely "over the hill" by the age of 40. They were told — in no uncertain terms — that they should retire, as they were unfit for service after attaining that ripe old age!

That just isn't so, says Dr. Otto Appenzeller, professor of neurology at UNM's School of Medicine, who's the next speaker in the Community Focus Series at the Technology Transfer Center on Tuesday, Oct. 7, at noon.

His talk, "Forty and Not Yet There: Aging and the Nervous System," explores how regular aerobic exercise — rather than heroic competition — can beat those "middle-age blues" for people fearfully approaching what they consider the downhill trail.

Appenzeller practices what he preaches. He's 56 now, but didn't start running until 15 years ago. He admits he's a running addict, and he appears much younger than he actually is.

His research has covered a wide variety of subjects: migraine headaches, exercise-caused bodily chemical effects, human reactions to endurance training, exercise and mental health, and many aspects of sports medicine. His studies — and those of oth-

ers — present documented scientific evidence that aerobic exercise helps stave off the deterioration of nervous system function that's experienced with aging.

Appenzeller's looking for some solid scientific understanding of the so-called "runner's high," and the depression/exercise withdrawal syndrome that results when a runner is deprived of his or her daily "fix." That's the reason he organized, six years ago, the annual Sandia Crossing Wilderness Research Run from Tijeras to Placitas. (The course is 28.5 miles long, and most of it is more than 9000 feet above sea level.) Researchers from around the country gather at race time each year to learn more about the physiological changes that occur in athletes — specifically runners — trained for endurance activities.

Appenzeller received his MD from the University of Sydney, and has been at UNM since 1967. Previously he was chief of neurology service at the VA Hospital in Cincinnati (Ohio) and an assistant professor of neurology at the University of Cincinnati's College of Medicine.

He's a charter member of the American Medical Joggers Assn. and was a member of the medical advisory board on the 1984 U.S. Olympic Committee. Since the late '70s he's been a director of both the N.M. Marathon Clinic and the N.M. Health Enhancement and Marathon Clinics Training Center.

## Stress Test Raises Sticky Question

by John Shunny, Ret.

Back in April, wandering through a local sporting goods shop, I saw a flyer announcing that an Albuquerque health club was offering a complete physical exam plus a stress test for a mere \$99. Since retiring from Sandia four years ago, I've come to appreciate those periodic physicals offered by Medical to active employees and, since turning 60, I'd been thinking about having our family doc examine me. Only his exam would cost \$300 to \$400, depending upon the options selected, and the cost of a routine physical isn't covered by Transamerica.

So the \$99 special caught me at the right time. The frosting on the cake was the stress test, including an electrocardiogram (EKG), in which you run on a treadmill until exhaustion while your heart's performance is transcribed upon a long paper roll [Ed. Note: John's idea of frosting]. Afterward, a cardiologist checks the squiggles on the roll for abnormalities. I signed up and paid my \$99.

I should mention here that my health was fine. After leaving Sandia, I continued a daily regimen of running or biking and had just concluded a strenuous season of cross-country ski instructing. All the vital signs seemed, well, vital.

The actual exam and EKG were conducted by a physiologist. Very thorough, very competent. The stress test went well, with my performance scoring very high for age 60. A sample of blood was taken, and we made a date to go over the results the following week.

They gave me all the good news first. Great results on the blood chemistry, the physical exam, eyes, ears, muscle tone, etc. "But you're positive on the EKG." My first thought was that this was another bit of good news. In medical parlance, however, "positive" turns out to be less than good — its opposite is not "negative" but, rather, "normal." My EKG was abnormal and, in this context, that's not good.

"What now?" I asked.

"Better go see a cardiologist" was the reply. I left feeling that perhaps time had finally caught up with me.

It's my good fortune to have a doctor friend, Jon Abrams, who heads the cardiology group at UNM's Med School. Jon's practice is extensive, his schedule is frenetic, and so I was pleased that he was able to review my EKG. He called me the following week: "Yes, it's positive, but knowing you and your high level of activity, I have a hunch it's a false positive. I'm not sure what to tell you, John. If you were 40, I'd say forget it. But you're 60 and if you were some guy who'd just walked in off the street with this, I'd have to recommend a thallium stress test. It's complicated and it's expensive."

The thallium stress test is similar to the treadmill test except that when they've got you up to your maximum heart rate and near exhaustion, a radioactive isotope of thallium is injected. A minute or so later the treadmill stops and you stretch out on a table for 20-minute scans of your heart from several perspectives by a special camera. The isotope enters the blood stream, and the scan gives a kind of picture showing the extent to which oxygenated blood is suffused throughout the heart. If the blood supply is cut off or diminished in a portion of the heart, you've got troubles.

And, yes, it's expensive, some \$900. But for me this was a procedure instituted in search of suspected heart disease and thus is covered by Transamerica (up to 80 percent).

Another week followed as I awaited the results. Medicine moves at a glacial pace while the patient idges. Then Jon called. The thallium scan had been read by the thallium scan specialist. "And it's positive," he said. "I tried to convince him otherwise but he says no and I respect his evaluation. You'd better come in so that we can talk about this." We made a date.

Meanwhile, Jon invited me to a medical symposium on cardiovascular risk to hear Dr. George

Sheehan, guru of running and medicine, give a talk entitled "The Lessons of Jim Fixx." Fixx, you'll recall, wrote a best-selling book on running and then was so inconsiderate as to drop dead during a run. Dr. Sheehan really doesn't subscribe to the "sudden" aspect of sudden death, maintaining that a careful study of these incidents almost always reveals earlier chest pain, undue fatigue, or other symptoms. Fixx, a friend of Sheehan's, had had symptoms; furthermore, he had a very high cholesterol level and a family history of heart disease.

I left the symposium with spirits somewhat lifted. After all, I had yet to experience the slightest chest pain while running, I wasn't fatigued, my cholesterol level was good, and my parents were free of heart problems. Still . . .

Talking with me in his office about my second positive reading, Jon alluded to one other element: "Before you began the running part of the test, your EKG showed an extra beat. Have you had that before or have you ever noticed any unusual beats?"

"No, and why would an occasional extra beat be significant?"

"Could be a symptom of a problem if the beats occurred frequently. I think we better have you wear a Holter monitor for 24 hours."

A week later I picked up the monitor, essentially a tape recorder that records your heartbeat through some six leads attached to your body. It hangs on your belt, and you do all your usual activities for a 24-hour period. For me that included a vigorous workout on my bicycle.

In early June, Jon and I met to review the situation. The Holter monitor results were "benign." That's good. "But I see three options," Jon continued. "We could do nothing — just hope for the best. Or I could put you on medication — beta blockers. This stuff may have some undesirable side effects though — make you sluggish."

"Our third course is a big step — an angiogram, that is, a recording through a cardiac catheter. A catheter is inserted into an artery up into the heart. A dye is released through the end of the catheter, and we then take X-ray motion pictures of the blood's circulation in and around the heart. The film shows any blockage in the blood vessels. Angiograms are a surgical procedure and, though it's rare, people have been known to die in the process. For you, though, I'm inclined to recommend we go ahead because I'm not convinced you actually have a problem, and I don't want you to become a cardiac neu-

rotic. The angiogram gives unequivocal results, it's definitive, and that's what we need here."

Although I hesitated and asked for a few days to think it over, I knew immediately that I'd go for the heart catheterization. I'd had several weeks of the anxiety that accompanies an uncertain diagnosis, wondering each time I ran or rode a bike whether I might be overdoing it. A certain diagnosis of heart disease wouldn't be easy to live with either, but chances were that whatever I might have would be treatable. And I certainly didn't fancy popping heart pills into the indefinite future when some possibility still existed that my heart was normal.

In late June I had the angiogram, my first surgery ever. It was a truly big deal — the operating room and all the machinery of modern medicine, people in masks and blue gowns, orders curtly issued and acknowledged, a rapid-fire pace, and a certain tension overall. I was awake throughout the 45-minute procedure, having had only a local anesthetic. At the end, the assistant cardiologist completed the dressing on the incision, reached up and removed his mask, and wryly observed, "Well, here we are — \$3000 later and your pictures look pretty normal. So much for the \$99 specials."

That afternoon Jon came to my hospital room with the final results. I won't forget his words: "I have the best possible news for you. Everything is normal. You're clean as a whistle."

\* \* \*

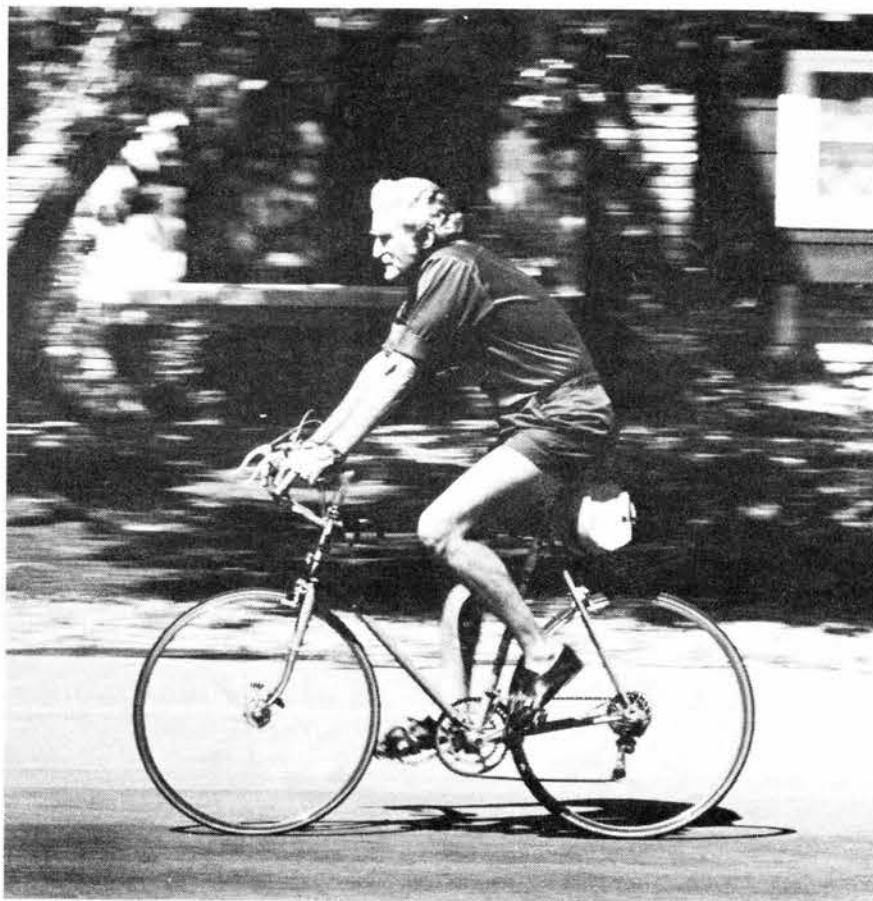
When given to a person who has experienced symptoms of heart disease or who is recovering from heart surgery, the stress test is the cardiologist's indispensable tool. For these two populations it is highly reliable, but it is less so for men and women outside these two categories, that is, for the nominally healthy people who, when the stress test comes up positive, have a difficult choice — to proceed with yet more tests, or not. My total bill in this episode was more than \$5000, a costly way to confirm what my body had been telling me all along — I felt fine.

### About That Voice in the Desert



For the last year or so, student Bradley T. Werner [of Caltech] has been using computer simulations to study the way loaded and unloaded dice roll. Werner's research is part of a larger effort to see if the general behavior of granular systems such as rock slides, sand dunes, planetary rings, and snow avalanches can be derived from the motions and interactions of the individual particles that make up a given system. . . . Even more curious is his research into the "yell" that certain sand dunes give out when they are kicked.

Science News



HIS VELOCIPEDA (aka bicycle) a welcome respite from the treadmill, John Shunny (ret.) covers long distances every day, using the city bike paths. In the old days, John used to race the Toltec & Cumbres Railroad: part of the reason his heart's in such good shape.

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Lee Stinnett (3316) 34 yrs.



Erlinda Marquez (3426) 10 yrs.



BLOWING BUBBLES of gum instead of champagne, the members of the Highballers and their coaches celebrate their winning the Sandia Labs Women's Softball Association's 1986 season. They had a 14-0 record and the league tournament record of 4-0. (L to r, back row:) Mary Gardner, Karen Claghorn, Mary Mercado; (second row:) Renae Solether (6250), J. J. Sanderson, Marc Poloski (2542), Margaret Johnston, Patti Salas, Anita Caress (1834), Jim Salas (2512); (bottom row:) Donna McConnell (5249), Vicki McConnell (1543), Mary Gachupin (7818), Linda Garcia (155), and Ruth Varga (3150). Not pictured are Diana Silva and Ken Varga (both 7522).



Dick Shaum (7556)



32 yrs. Dutch Benedict (3423)



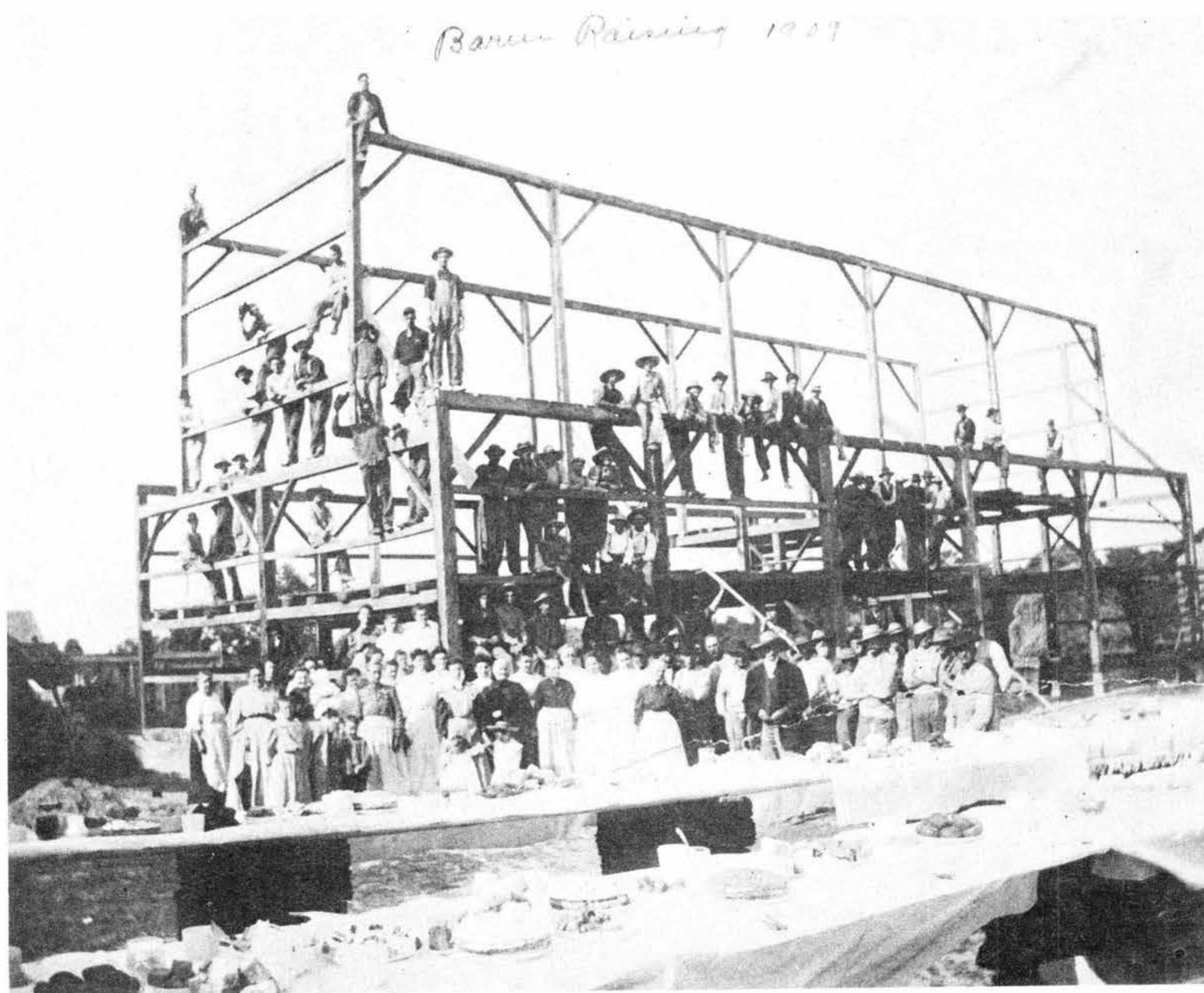
31 yrs. Don Knott (7862) 36 yrs.

**Marching on Thin Ice**



So just when *is* ice safe to walk on? The answer, and a lot more besides, can be found in ACS Monograph No. 81. . . . It states that the French Army had, in 1893, determined that: "When 4 centimetres thick, new ice in the process of formation will bear the weight of one man; when 9 cm thick, infantry marching in open formation; when 12 cm, an artillery train of 8-cm guns; when 16 cm, siege guns with loaded caissons; when 29 cm thick, it will carry almost any load that would be placed on it." The U.S. Army apparently used very similar figures and went one better: ice 38 cm deep would support railroad tracks and trains, whereas ice 61 cm thick "withstood the impact of a loaded railroad passenger car falling 60 feet but broke under the influence of a locomotive and tender." The mind boggles as to how these observations were made.

*New Scientist*



*Barn Raising 1909*

**Favorite Old Photo**

If the high price of new housing has got you homeless, then consider the way our fathers and grandfathers put up structures. This picture shows my Dad and a few friends in 1909 as they undertook a barn raising in Dansville, Mich., on my grandparents' farm. Neighbors from miles around would pitch in on construction while the women set up a magnificent repast—note tables in foreground. That's my Dad, at left, standing on the corner below the top level. Last time I was in Dansville on the farm, I noted that the old barn had been replaced by a more contemporary structure: a Butler building. (Ken Fortman—retd.)

# MILEPOSTS

## LAB NEWS

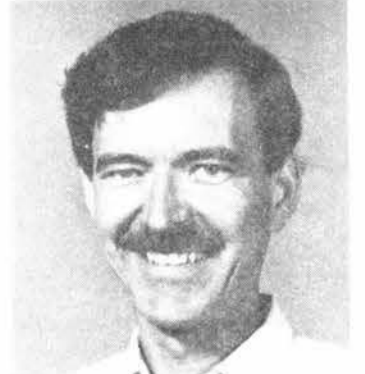
SEPTEMBER 1986



Elveta Bishop (150) 10



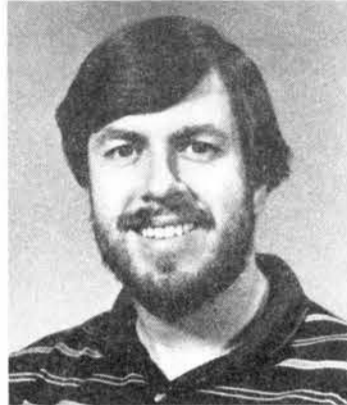
Ken Young (6314) 15



Joe Kubas (7483) 10



Bob Balthaser (7262) 25



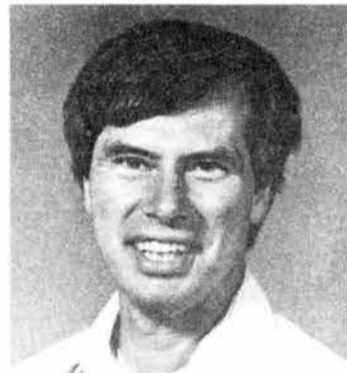
Steve Barnard (7474) 10



Nick Nolasco (3426) 15



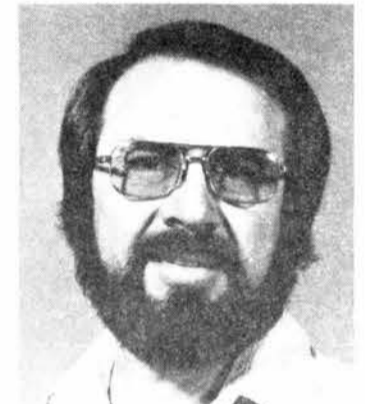
Ken Boldt (6222) 10



Al Marshall (6433) 10



Joe Brown (3424) 25



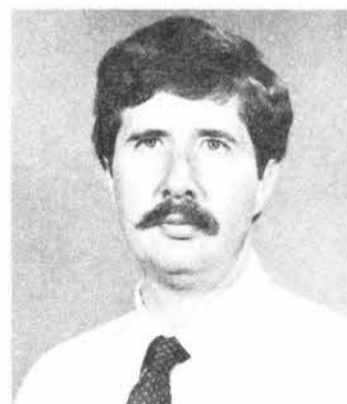
Joe Padilla (7481) 10



Tom Gardner (2853) 25



Johnny Rice (7474) 10



George Allen, Jr (6323) 10



Tom Martin (1250) 30



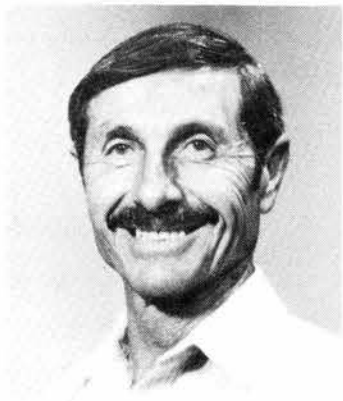
Dave Tafoya (7818) 15



Ken Hicken (8185) 15



Ray Leuenberger (7484) 20



Orlando Rodriguez (7818) 20



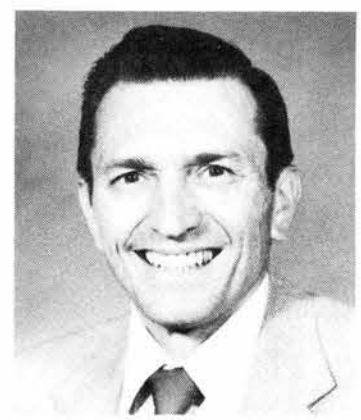
Mel Widner (1221) 15



Van Luhrs (5111) 35



John Barnhouse (8261) 25



Jim Lang (5153) 35



Hazlet Edmonds (3431) 20



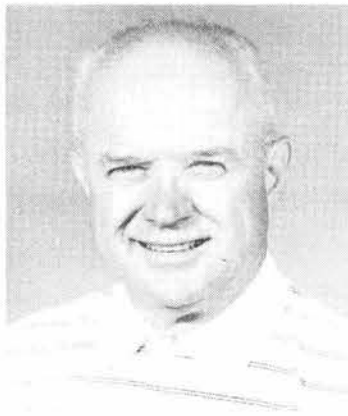
Rachel Botner (3726) 25



J. B. Hamlet (154) 30



Larry Bertholf (8430) 20



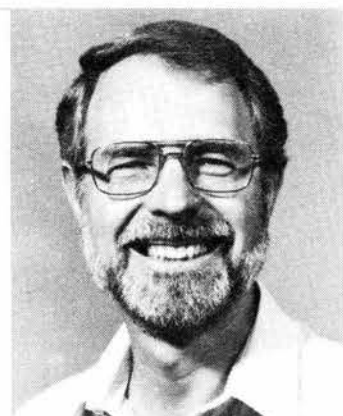
Bill Lutgen (2853) 30



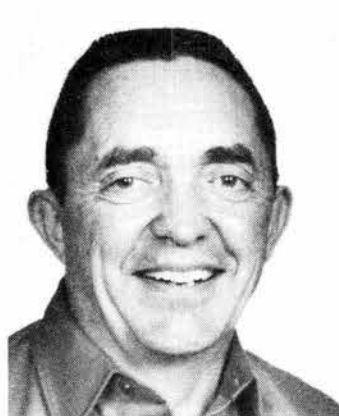
Edgar Boeck (7212) 25



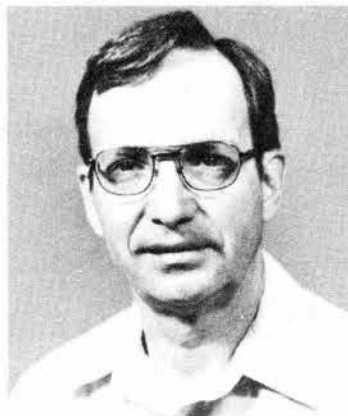
Dolly Ebaugh (3716) 20



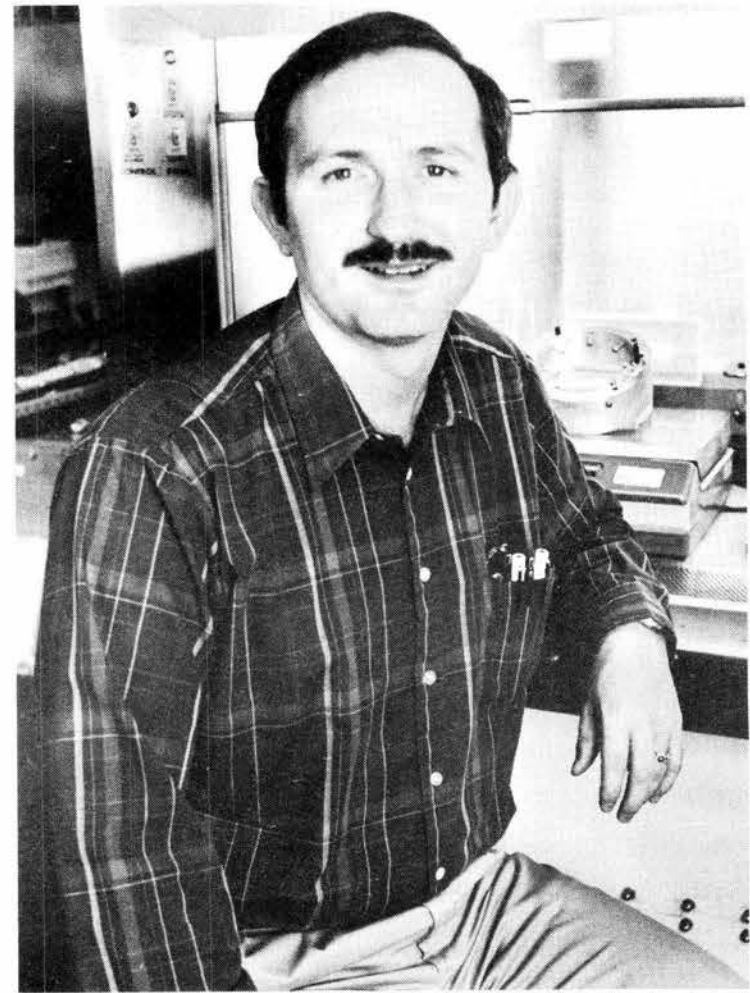
Warren Miller (6312) 30



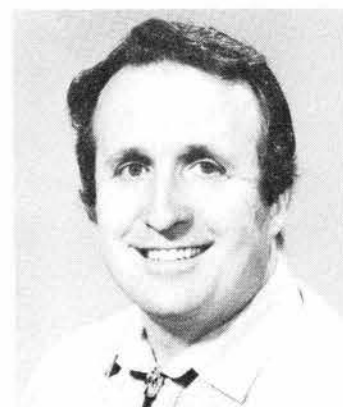
Rodger Page (8164) 25



Jim Plimpton (7110) 25



Michael Lucas (7472) 15



Douglas Smathers (5252) 20



Julia Norwood (3400) 10



Eddie Walker (7222) 35

# eCP the need continues

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2. Include organization and full name with each ad submission.
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4. Use 8 1/2 by 11-inch paper.
5. Use separate sheet for each ad category.
6. Type or print ads legibly; use only accepted abbreviations.
7. One ad per category per issue.
8. No more than two insertions of same ad.
9. No "For Rent" ads except for employees on temporary assignment.
10. No commercial ads.
11. For active and retired Sandians and DOE employees.
12. Housing listed for sale is available for occupancy without regard to race, creed, color, or national origin.

## MISCELLANEOUS

CEDAR FENCE STAKES, dog-eared, weathered, approximately 90, 5' x 2-1/4". Kirson, 293-5284.

PLYWOOD, particle board, 2x4s, styrofoam and urethane sheet insulation, \$110; 30" x 80" hollow-core door, \$10. Koletar, 255-4751.

STAINLESS STEEL vibrating motor, \$35; silver tea & coffee service w/tray, \$100. Pinkerton, 255-2505.

REDBALL RUBBER BOOTS, sm. men's or med. lady's, \$12; electric typewriter, \$45; English riding clothes. Siegrist, 299-3088.

MOTORCYCLE HAULER, Trail-A-Bike, mounts on hitch tongue, holds front wheel, rear rolls, for bikes under 300 lbs., \$30. Schkade, 292-5126.

METAL HARDTOP for Jeep CJ5; four 10-15 LT snow tires w/rims. Otts, 884-5072 evenings.

BURTON SNOWBOARD, Elite 150, used twice, \$195. Healer, 298-6967.

FOUR TIRES, Uniroyal steel-belted radials, whitewalls, P235/75 R15, \$100. Robinson, 865-7787.

COUCH W/MATCHING CHAIR; hanging lamp; professional hair dryer; audio cassette holders. Michele, 298-8576.

TRUNDLE BED, blue-green and black material, \$100. Mendel, 265-3840.

DELTA WOOD LATHE, refurbished and unused since, 4-spd., standard-duty w/heavy cast iron leg set, \$595. McDowell, 281-1509.

MISC. 924 PORSCHE parts: 4 P215-75R15 tires and wheels, \$80. Rees, 821-2256.

CANOE MOTOR MOUNT, \$15; D.P. rowing machine, electric exercycle, both for \$150. Johnston, 294-4574.

TABLE, round, 57", wicker top, wrought iron frame, 6 matching chairs, \$40. Rost, 268-2326.

CAST IRON BATHTUB, right-hand drain, light green; gas stove, avocado; \$30 ea. OBO. Cowen, 296-5980.

COUCH, 2-cushion, 84", brown and gold velvet, \$100. Kozlowski, 298-4869.

FIREPLACE HEAT EXCHANGER, 5-tube, \$20; GE portable dishwasher w/butcher block wooden top, \$60. Pavelko, 296-3346.

DOORS, 2 ea., swinging, 30" x 80", painted wood, free if you pick up. Kovacic, 256-9867.

LAGUN VERTICAL MILL, DRO Kurt vice, \$6500; Clausing model 1500 lathe, 3-4 jaw taper KDK, \$5000. Wolfe, 299-6982.

BUNK BEDS, sofa bed, furniture, speakers, toys, children's and baby clothes, more; garage sale, Sept. 27, 8 a.m.-5 p.m., 8525 Princess Jeanne NE. Borgman, 299-6010.

SNOWMOBILE, 1979 Kawasaki 440, w/1980 Snobird 2-place trailer, tilting for snowmobiles, \$1200 for both. Scranton, 869-6589.

MOTORCYCLE HELMET, red Nava, large, worn one week, \$40. Byars, 294-6676.

VACUUM CLEANER, Eureka upright, \$50; dining room set, table & 4 chairs, contemporary, \$200 OBO. Sandoval, 291-9004.

COLOR TV, Zenith, 19", remote control, model SG-196-OW, \$50. Dalphin, 265-4029.

TWO SCUBA TANKS w/regulators and accessories; crystal chandelier light fixture, best offer. Bailey, 293-8861.

MOVIE PROJECTOR and case, Bell & Howell. Carlin, 292-5428.

BEDROOM SET: dresser, nightstand, headboard, mirror; coffee table, end table, Mediterranean style, walnut-veneer finish. Helling, 281-5536 or 294-0582.

PHOTO EQUIPMENT: Balcar studio variable strobe, 2400 WS, w/3 heads, umbrellas, extension stands; valued at \$3500, sell as pkg. for \$2300 firm. Spencer, 867-4506.

IBM-PC DUAL FLOPPY DRIVES, 640K memory, Hercules color graphics, clock/calendar, NEC composite monitor, IBM keyboard, documentation, \$1495. Coughenour, 294-3528.

SOFA AND MATCHING LOVESEAT, \$275; La-Z-Boy recliner, \$150; dinette set w/4 chairs, \$150. Thompson, 292-2877.

30-GAL. AQUARIUM w/filter, wooden stand, grow light, other equipment, fish included, \$125. Olajos, 256-1649 evenings.

MINI-BLINDS, natural wood: two 57" x 5' double-control, two 48" x 42"; two metal, deep blue, Levolor, 33-1/2" x 5'. Montoya, 883-9115.

FLATBED TRAILER, 16', dual axle, 10,000 lb.-rated, removable plywood sides, \$975. Jones, 281-3617 after 6.

BAND EQUIPMENT: Bi-amp model 1282 mixing console w/road case, EV-SH15 horn-loaded PA cabinets, miscellaneous Shure/EV microphones, stands, cables, etc. Rathbun, 888-3344.

SAT MANUAL: "How to Take the SAT Examination," 372 pages plus 2 tape cassettes, \$30. Mosteller, 256-3227.

APT.-SIZE WASHER AND DRYER; Ford tires, wheels, caps; chain link fencing, clothes line poles, misc., garage sale, Sept. 27-28, 9-6, 5520 El Encanto NE. Walsh, 265-7498.

SAVIN 755 COPIER, 2 paper trays (8-1/2 x 11, 8-1/2 x 14), toner and dispersant recently added, \$400. Vernon, 892-6571.

INFANT CAR SEAT, Strollee, \$15; blue denim collapsible stroller, \$10; bronze 3-globe pool table light fixture, \$75. Kipp, 821-6563.

TI PROFESSIONAL COMPUTER, 512K, 3-D graphics, color monitor, 12 Bd modem, 2 disk drives, software including Lotus. Harlan, 881-2791.

BEDROOM FURNITURE: girl's white dresser and chest of drawers, 7-drawer wooden desk w/chair, two lamps. Johnson, 292-4643.

STORM DOOR, aluminum, self-storing window, 3'6" x 6'8", RH, \$50. Walker, 821-5938.

CHEST OF DRAWERS, white, 48" x 32" x 15", 10 drawers, \$30. Caskey, 294-3218.

ATARI COMPUTER SYSTEM, never used, 130XE PC, DOS 2.5; 1050 disk drive, XMM801 printer, \$425. Campo, 298-4239.

GAS OVEN AND BROILER, wall-mounted, 24" wide, O'Keefe and Merritt, w/fittings, \$75. Guttman, 888-5114.

ANTIQUUE BEDROOM SET, 3-piece, cherry wood, 7 ft. wardrobe, headboard and curved footboard, dresser w/mirror, \$800. Baca, 296-8474.

GI JOE ACTION FIGURES and vehicles, Cabbage Patch accessories, woman's 3-spd. bicycle, more; garage sale, 8609 Aztec NE, Sept. 27, 9-3. Skogmo, 292-9773.

HIDE-A-BED SOFA, end tables, kitchen table, chairs, waterbed, Bentwood rocker, chest of drawers, weight bench and weights. Johnson, 821-9401.

ROTOTILLER, Black & Decker, electric, \$80; Sears shredder/bagger, \$40;

heavy, 60" double screen doors, \$10. Weston, 255-1196.

TABLE AND 6 CHAIRS, \$50; complete World Book Encyclopedia w/science books, \$100; couch, \$100; exercise bike, \$20. Chavez, 296-3160.

CAMPER CAP for LWB, 6' x 8' x 29", windows on all four sides. Hill, 299-0019.

ETHAN ALLEN TRESTLE TABLE, dark pine, four side chairs, two arm chairs, \$700. Yarrington, 296-7714.

COLOR TV, 25", RCA console, \$250; metal truck box for mini-pickup, \$30. Gonzales, 255-2506.

CABIN TENT, Coleman, 8' x 10', seldom used, cost \$180, asking \$130; new nylon double-wide air mattress, \$20. Levan, 821-0980.

## TRANSPORTATION

'66 VW DUNE BUGGY conversion, \$450 OBO. Volk, 299-1702.

'81 HONDA CX500D motorcycle, 13K miles, recent tires and battery, cover, fairing, luggage rack, crash bars, \$900. Zirzow, 294-7296.

'84 YAMAHA YZ80, original tires, never raced, \$650. Kerr, 296-1991.

10-SPEED BICYCLE, \$50. Siegrist, 299-3088 after 5 and weekends.

'77 DODGE VAN, SWB, V-8, radials, AT, PS, PB, AM/FM stereo, factory custom interior, \$4500 firm. Romero, 1-864-6254.

'68 TRIUMPH TR4, new fiberglass hardtop, \$1200 OBO. McCoy, 821-2509.

'85 FORD F150 1/2-ton pickup, loaded, 6.5K miles, w/fiberglass camper shell, \$9995 cash. Freshour, 256-9168 after 5.

'65 MUSTANG FASTBACK, 32K original miles, 289 cu. in., 2BBL, AT, AC, AM/FM stereo, steel Mustang rims, \$5900 OBO. Durnell, 255-8283.

'82 CORVETTE, Collectors Edition, voluntary repossession, open for sealed bids, low mileage, we reserve the right to refuse all bids, all bids subject to prior sale. Sandia Lab Federal Credit Union, 844-4555.

'70 MERCURY MARQUIS, 4-dr., one owner, AT, PS, PB, PW, cruise control, \$600. Rost, 268-2326.

'78 HONDA GOLDWING w/Equalean side car, extras, make offer. Johnston, 294-4574.

'81 JEEP CJ-7 Renegade, hard top, 258-6 engine, lift kit, oversize tires, stereo, 33.5K miles, \$6150. Hulme, 299-7715.

'82 DATSUN 280ZX Turbo, 38.8K miles, AT, AC, T-Top, PW, AM/FM cassette, \$9300 OBO. Pantuso, 884-4078.

'83 GMC HEAVY-HALF 4X4, Sierra Grande, cruise control, tool box, aux. tank, low mileage, extras. Williams, 293-1765.

'67 FORD FAIRLANE 500, one owner, Long, 298-1668.

'71 MGB, restored 2 yrs. ago, rust-free, extras, make offer. Young, 294-6228.

'83 CHEV. S-10 PICKUP, V-6 Tahoe, AT, AC, PS, PB, cruise, AM radio, 26K miles, \$6000. Navoda, 881-7817 or 299-9228.

'86 KAWASAKI NINJA 1000R, header and new tires, take over payments OBO. Gonzalez, 299-0005 or 293-3697 leave message.

'82 FIREBIRD, 35K miles, fuel-injected, 4-cyl., 4-spd., PS, PB, AC, cruise, gauges, AM/FM cassette, \$5300. Bader, 884-8696.

'73 OPEL GT: rebuilt engine; damaged fender, can be restored; \$1000. Calocci, 822-0371.

'79 F151 FORD PICKUP, V-8, 4-wheel drive, 4-spd., long wide-bed, radio, 70K miles. Houghton, 299-3386.

'82 FORD ESCORT, AC, AM/FM cassette stereo, 45K miles, one owner, \$2800 OBO. Sandoval, 291-9004.

'80 FORD GRANADA, low mileage, \$2350. Cooper, 888-0967.

'77 VW RABBIT, regular gas, fuel-injected, manual transmission, \$1800. Carroll, 296-0256.

'78 CHEV. MONZA, 44K original miles, AM/FM radio, \$1500. Carlin, 292-5428.

GIRL'S 16" BICYCLE w/training wheels, \$45. Gregory, 821-1429.

'83 MAZDA GLC Hatchback, 5-spd.,

32K miles, AM/FM, cruise, AC, below book, \$3600. Dunckel, 888-2484.

'79 BUICK REGAL, 65K miles, new paint and tires, rebuilt AT, AC, power accessories, AM/FM stereo cassette, \$2500. McDowell, 821-0339.

'78 FORD GRANADA, 2-dr., V-8, 67K original miles, \$1700; 76' GMC 1/2-ton truck, Sierra Classic, 454 engine, 67K miles, all-weather tires, \$3300. Vigil, 821-8059.

'86 KAWASAKI NINJA 1000R, 4K miles, \$3600. Knutson, 888-1012.

'57 CHEV. WAGON, 4-dr., AT, \$1500. Pierce, 299-2801.

'72 MAZDA RX2, 4-dr., 4-spd., AC, \$600 OBO. Bradley, 293-9586.

'83 MALIBU, PS, PB, AM/FM stereo, cruise control, 4-dr., V-6, 67K miles, below book, \$3950. Jones, 281-3617.

'79 HARLEY DAVIDSON LOWRIDER, 1340cc, 7.2K original miles, has been in storage, \$4200. Cuaron, 873-3438.

'78 MIDAS MINI-MOTORHOME, 23', generator, dual AC, travel pod, awning, dual fuel tanks, CB. Lopez, 268-9190.

TOURING BICYCLE, Bertin, 61cm, upgraded, extras include spare components and tools, more than \$1100 invested, \$450 OBO. Rathbun, 888-3344.

MEN'S BICYCLE, 19", blue, Centurian Custom Deluxe, \$85. Kipp, 821-6563.

'85 CHEV. VAN, deluxe conversion, loaded, AT, AC, stereo, couch/bed, more, warranty, \$17,000 OBO. Hall, 898-3363.

'54 FORD CUSTOMLINER, 4-dr., new interior and exterior, \$1954 OBO; misc. MGA parts. Schaub, 821-7242 after 5 and weekends.

'82 TOYOTA LONG-BED PICKUP, 5-spd., AM/FM cassette stereo, AC, 28K miles, \$4300. Vernon, 892-6571.

'74 DATSUN 610, 4-dr., AC, AT, rebuilt engine, \$1350. Schofield, 292-7220.

'68 JEEP WAGONEER, 4-dr., Buick 350 V-8 engine, AT, original owner, extra parts included, \$2200. Hochrein, 299-5225.

'75 VW CAMPER BUS, sleeps 4, \$2100 OBO. Eatough, 822-1297.

'69 PLYMOUTH VALIANT, 6-cyl., AT, AM/FM stereo and 8-track, radials, new battery and brakes, \$350 OBO. Andraka, 294-2618.

TREK 560 BICYCLES, medium-size frames, new, \$350 ea. OBO. Loucks, 281-9608.

'85 SUBARU 4X4 GL WAGON, Hi Lo range, 5-spd., AC, fog light, full service spare, manuals, cargo cover, NADA \$8450. Ritchey, 268-7620.

'81 YAMAHA SR250TH, ridden by adult, 13K miles, 60 mpg, w/trunk and rear seat, \$400. Hass, 299-3506.

'68 FIAT 850 SPYDER, needs work, make offer. Chavez, 296-3160.

'74 BRONCO 4X4, V-8, AT, PS, AC, AM/FM, KC lights, big tires, extras, \$3500. Sanchez, 832-6206.

## REAL ESTATE

2-BDR. MOBILE HOME, 14' x 66', 2 full baths, washer/dryer, dishwasher, take over payments. Lujan, 865-4058 after 5:30.

3-BDR. MOBILE HOME, 14' x 72', 2 baths, near Wyoming Gate, '72 model, \$10,000. Romero, 293-4847 after 5.

2.5 ACRES, mountain land, off South 14, 1 hour from Albq., trees, water, view. Zawadzka, 884-8956.

3-BDR. HOME NE, 1100 sq. ft., new beige carpet, roof, and kitchen cabinets, \$67,900. Reinarts, 881-6135.

3-BDR. HOME, Chelwood Copper NE area, 1-3/4 bath, covered patio, backyard access, den, schools with-in walking distance, \$73,800. Lyons, 293-4188.

2-BDR. MOBILE HOME, '83 model, 14' x 64', 1-1/2 baths, adult section of Cedar Crest park, extras. Helling, 281-5536 or 294-0582.

14 ACRES RIVER LAND, Bernalillo, fenced, mobile home goes with property, \$20K/acre, trades considered, owner will carry. Martinez, 836-3451.

4-BDR. HOME, 2 baths, 2450 sq. ft., 2 fireplaces, basement, garage, 2.4 acres, Cedar Crest. Miller, 281-2440.

2-BDR. TOWNHOME, 1000 sq. ft., 2' x 6" construction, 1-1/2 baths, carpet throughout, custom drapes, \$51,000. Sanchez, 298-4803.

1 or 2 ACRES on Raymac Rd. SW (one is a corner lot), 1 acre on Hawaii. Brumley, 877-2667.

9 ACRES, telephone and electricity, near Estancia, bounded by roads on 3 sides, \$12,500 at 10% interest and 10% down payment. Thomas, 256-1921.

3-BDR. HOME, Mossman, 1 bath, hardwood floors, FP, CFA, thermal windows, new stucco, sprinklers, updated kitchen, \$73,800. Anderson, 881-0934.

4-BDR. HOME, 2-1/2 baths, den, 2600 sq. ft., split-level, plus 750-sq.-ft. finished basement, large cul-de-sac lot, near schools. DeWerff, 298-1029 evenings.

3-BDR. FAMILY HOME, recently remodeled, study, ceramic tile floors, automatic sprinklers front and rear, NE location. Carrigan, 821-5856.

4-BDR. MOUNTAIN HOME, near Angel Fire, wooded, near fishing and skiing, modern, furnished, want to time share. Abbott, 298-2039.

TWO HOMES: 3-bdr., Jewett NE, 1-3/4 baths, brick veneer, \$79,500; 3-bdr., Dakota NE, all brick, Mossman, \$89,500. Grube, 884-0853.

## WANTED

CEDAR FENCE STAKES, dog-eared, well-weathered, need 48, 6' x 2-1/4". Kirson, 293-5284.

TO PHOTOCOPY: ingredients reference cards for preprogrammed recipe cards for Sunbeam microwave oven w/menu-matic recipe card reader. Duran, 268-7339.

BABYSITTING TRADE, single parent with one-year-old daughter wants to trade babysitting with other parents. Lambert, 294-4188 after 5:30.

ROOMMATE, share 2-bdr. house in Tijeras Canyon, 10 min. from Eubank Gate, non-smoker, dog OK, starting in Oct. Boslough, 294-3907.

HOME DECORATING MAGAZINES, willing to pay half price for recent or older issues. Ruby, 884-9318.

HOME CARE, need female to care for an elderly female patient two nights and/or two days per week. Wages negotiable. Coulter, 867-2127 after 5.

TO COPY: selected episodes of "All Creatures Great and Small" on tape. Caskey, 294-3218.

INFORMATION FROM WITNESSES of two-car accident at Eubank and Central on Friday before Labor Day at 8 a.m. Dubicka, 296-6557.

HOUSESITTING JOB: by university student, knows plant care, is good with animals, references available, reasonable rates. Luhrs, 281-2595.

METAL DETECTOR. Hill, 299-0019.

TWO HOUSEMATES, male, share 4-bdr. house, NE Heights, \$150 mo., share utilities, \$100 DD. Sanchez, 832-6206.

CAMPER SHELL for Nissan pickup, low profile with supports. Gonzales, 255-2506.

## SHARE-A-RIDE

CARPOOL: Would like to form carpool from Candelaria & Rio Grande or 12th & Candelaria areas, non-smoking only. Scharnberg, 345-1523.

## LOST

COAT SWEATER, dark navy blue w/buttons, IZOD label, lost Sept. 9 at the Technology Transfer Center, Bldg. 825. Levin, 299-0891.

# Artists Series & All That Jazz

JAZZ IS ON THE MENU, along with baron of beef, chicken divan, and a lot of other good stuff on Sunday night (Sept. 28) when the Artists Series swings back into action. Following a special buffet served from 5-7 p.m. for only \$5.95, the Talisman group plays contemporary and classical jazz — including some Duke Ellington favorites — from 7-9. All Sandians and DOEans (not just members) are invited, says Club manager Sal Salas. Don't miss out on some extraordinary entertainment; call in your reservation (265-6791) right now.

THE CORONADO WOLFPACK kicks off the 1986 football season with one of its famous (infamous?) tailgate parties tomorrow afternoon (Sept. 27) in the west parking lot of UNM Stadium. It all starts at 4 p.m., and these stalwart Lobo supporters will whoop it up until game time, when UNM takes on the San Diego State Aztecs. Honcho Ken Deller says apparel of the day is Western garb, so get those boots, jeans, and Stetsons ready to go! The Wolfpack furnishes BBQ beef sandwiches, beer, wine, soft drinks, and condiments; you bring your favorite pot-luck dish to go along with the BBQ — and don't forget a lawn chair. If you're not a member of this elite group, but want to get in on the fun, Pack dues for the coming year will be cheerfully accepted at the party.

SOME TOP-NOTCH FOLKS were elected members of the Board of Directors at the annual meeting on Sept. 8. Elected to two-year terms were: Chuck Duus (132), Mark Kiefer (1265), Marlene Smith (7260), and Ken Sorenson (6322). Alice Maese (121), Tom Mehlhorn (1265), and Michael O'Bryant (2858) will serve one-year terms. Joining them on the board will be Ernie Montoya (7475), Phyllis Padilla (3521), Marv Plugge (5171), and Bob Schmedeman (ret.), who have one year remaining on their two-year terms.

IT'S HARVEST NIGHT HOEDOWN time next Friday, Oct. 3, with some great company — those popular Poor Boys from Isleta. Beforehand, enjoy the two-for-one special featuring prime rib or shrimp scampi — two dinners for the low, low price of \$14.95. Get the same bargain price on other entrees as well; ask what else is cookin' when you call for reservations. Country/western lessons are on tap that night from 7:30-8:30, followed by a whole lot of stomp time in the ballroom until 12:30 a.m.

FAMILY/VARIETY NIGHT on Saturday, Oct. 4, starts out with a low-cost buffet from 5-6 p.m. that'll delight every member of the family. Afterward, it's high-caliber entertainment with Excalibur, as "Sword in the Stone" lights up the big screen.

HELP SPRUCE UP THE SLOPES at the Coronado Ski Club/Sandia Peak "walkdown" on Oct. 5. This annual event shapes up those slalom runs so they're ready for the schussboomers when the white stuff starts to fly. Meet your fellow cleaner-uppers at the ski lodge at 10 a.m., then take the chair lift to the top of the ski area, and walk down your favorite slope. Take time to admire the scenery while you're getting rid of branches and rocks that might stand in your way sometime this winter. Green and red chile, hamburgers, and other refreshments available too. It's free to members and \$3 for guests. More info from Lisa Mondy (6-1772) or Steve Ross (4-7017).

THESE JOKERS ARE WILD — well, maybe not exactly wild, but they sure have one heck of a good time when they get together. That's right — it's the T-Bird card players, and they're getting together next month on Oct. 16 and 30, starting at 10:30 a.m. Please note: These tricky T-Birds, as an experiment, are switching their get-togethers from blue Mondays to terrific Thursdays. Shows ultimate good sense, if you ask us . . .



NEW C-CLUB BOARD MEMBERS got together with the rest of the group last week. Seated, from left, are Al Chavez (appointed Sandia rep), Mark Kiefer, Marlene Smith, Phyllis Padilla, Ernie Montoya, and Marv Plugge. Standing (l to r) are Bob Schmedeman, Tom Mehlhorn, Leo Apodaca (appointed DOE rep), Ken Sorenson, Chuck Duus, and Michael O'Bryant.

THE DUKE CITY'S BEST brunch bargain is back again on Oct. 5, from 11 a.m.-2 p.m. For only \$4.95 (kids under 12 half price), you can load up on ham, sausage, baron of beef, that famous green chile, scrambled eggs, hash browns, fruit salad, salad bar, and more. And we have it on good authority that the C-Club Sunday brunch is such a crowd-pleaser it will be offered *twice* this month; there's another one scheduled on Oct. 19. Circle both dates on your calendar or — better yet — call for reservations today.

TWO WEEKS FROM TONIGHT, Oct. 10, the Freddie Chavez Foundation (not a philanthropic organization!) unleashes the Latin music for all you south-of-the-border fans. Freddie and the gang provide cha-cha and samba tunes from 8-midnight, following the two-for-one special dinner that night; filet mignon, poached halibut, and other mouth-watering menu items are available. Don't forget to reserve your space by calling the Club office.

CALLING ALL SINGLES — Come out and meet a bunch of nice people at the Indian summer singles party on Thursday, Oct. 16, right after work. It's free munchies, along with 50-cent draft beer and bargain-priced frozen drinks, from 5-7. A group called Graffiti (aka "The Scribblers") makes the happy music for dancing from 6-10. We're giving you a lot of advance warning so you can plan ahead on this one.

ATTENTION, WOULD-BE JUNIOR BOWLERS: Honcho Ciss Kelly says that boys and girls, seven years old through high school age, are needed to fill some remaining openings in the C-Club Junior Bowling League. Beginners are welcome. Call Ciss for more info at 255-8011.

THERE'S A LONG, LONG TRAIL a'winding . . . for you lucky folks who sign up for those C-Club getaways to far-off places. Take a look at these opportunities:

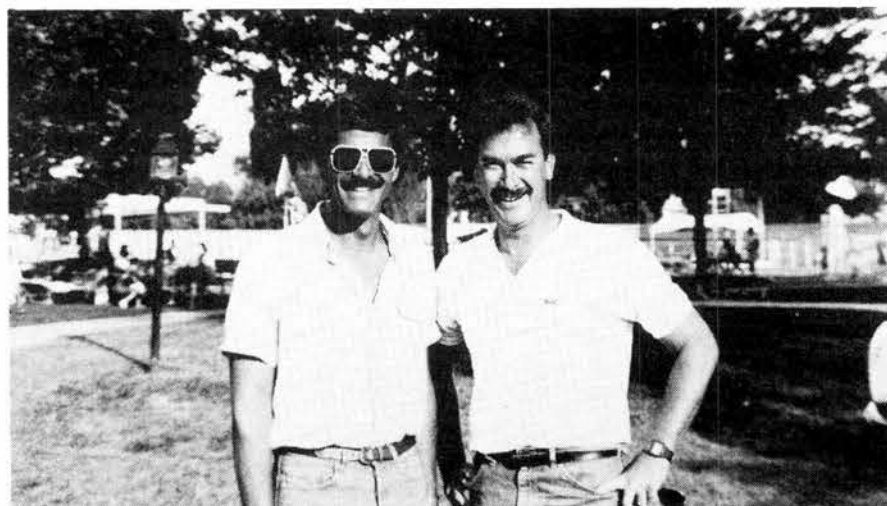
*Canyon de Chelly* — That second bus for can-

yon explorers is filling fast, so don't delay making your reservation for this one. The two-day bargain (\$98), set for Oct. 26-27, includes charter bus fare, a night at the Thunderbird Lodge, jeep tour of both canyons, a picnic at Wheatfields Lake, continental breakfast the first day, and a stop at the Hubbel Trading Post. Can't beat it — better join it!

*South America* — Now this really is a far-off place to be, starting Feb. 27 and returning March 12. The timing is superb; you'll be in Rio for its exciting carnival (optional at extra cost: the Samba Parade and Baille da Cidade). Then it's on to Buenos Aires, Sao Paulo, Lima, Cuzco, and the lost city — Machu Picchu. For \$2200, this gem includes round-trip air fare, 12 nights' lodging, three dinner shows, lunch at Machu Picchu, daily continental breakfasts, and five city tours. Go for it!

*Cozumel* — Just when the weather turns nasty around here, you'll be lolling on a sandy beach somewhere in this tropical paradise. Your postcard to the jealous folks back home will tell 'em all about your fabulous suite at the Club Cozumel Caribe, where everything's included. Everything means just that: all meals; unlimited beer, wine, and cocktails; use of all the CCC facilities — tennis, volleyball, shuffleboard, etc.; entertainment of all kinds, such as fiestas, beach parties, and hit movies; and water sports galore. The tab of \$745/person covers air fare, seven nights' lodging, moonlit cruises, all tips and taxes, plus the above.

*Southern California* — Maybe far-out is a better word than far-off for this one. Anyway, this sunny sojourn promises a terrific time from Dec. 29-Jan. 2 for every member of the family. The \$398/person price includes an all-day visit to Disneyland, four nights' lodging at Anaheim's Desert Inn Hotel (right across from D'land's main entrance), tour of Universal Studios, cruise to Catalina Island, a full day of LA sightseeing, choice reserved seats for the Tournament of Roses parade, dinner at Castagnola's Lobster House (Marina del Rey), and RT air fare. For some extra moola, you can whoop it up at Disneyland's fantastic New Year's Eve party. This one guarantees you a good start for 1987.



OLYMPIC CHAMPION Mark Spitz (left) got together with recreation manager Stan Ford when Spitz was in Albuquerque recently for the state swimming championships. Spitz signed a lot of autographs during his stopover at the Coronado Club patio. The swimming champ won seven gold medals — four in individual events and three in relays — at the 1972 Olympic Games in Munich.